

WATER RESOURCES BOARD

Tuesday, July 23, 2019
Operations & Maintenance Facility
1725 South Church Street
3:30 PM

A G E N D A

1. Consent Agenda:
 - A. Consider sole source purchase of Pit Raider & Nutri Pro odor control products2
 - B. Consider abandonment of sewer easement along Florence Road4
 - C. Consider Ransom Drive P.S. Replacement Final Change Order6
 - D. Consider Equipment Operator reclassification.....12
 - E. Consider Sodium Hypochlorite chemical contract extension.....13
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8. Consider SSR Engineering Work Order 09-47-001.3, Waste Load Allocation Model additional cost52
9. Review Sanitary Sewer Allocation for Future Land Use59
10. Dashboard
11. Other business
12. Adjourn



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MEMORANDUM

DATE: July 17, 2019
TO: Water Resources Board
FROM: Jimmy Stacey
SUBJECT: State Chemical - Sole Source Purchase

Background

In 2013, Operations and Maintenance noticed an increase in the number of odor complaints from the Saratoga Drive area. After investigating the matter, it was found the odor was coming from the Kensington Drive Pump Station which is fed by Tortuga Court Pump Station. The force main between these two pump stations is long and often experiences low velocity. These factors create an odorous and corrosive conditions.

Operations and Maintenance conducted a trial of Pit Raider, a sole source proprietary odor control product, to improve these conditions. It is a bacteria-based hydrogen sulfide treatment combined with a nutrient supplement furnished by State Chemical Products. The trial demonstrated Pit Raider reduced hydrogen sulfide to a minimal level, virtually eliminating the odor and greatly reducing corrosive effects to the manholes. The chemicals were purchased and distributed through the Kensington Pump Station to control ongoing odor issues. Our odor complaints greatly diminished, and the department works closely with a state chemical representative to minimize costs by maintaining optimal feed rates during summer dry and winter wet months.

Recommendations

Staff recommends the Water Resources Board recommend to City Council to approve the sole source purchase of Pit Raider and Nutri Pro odor control from State Industrial Products.

Fiscal Impact

State Chemical pricing for the Pit Raider and Nutri Pro will remain the same through the FY 2019/2020. The department has budgeted \$50,000 in the operating account *Sewer Pump Station Operations -Odor Control*.

Attachment

State Chemical Pricing

Water and Sewer Department

300 NW Broad Street * P.O. Box 1477 * Murfreesboro, TN 37133-1477 * Office: 615 890 0862 * Fax: 615 896 4259
TTY 615 848 3214 * www.murfreesborotn.gov



Care for Work Environments®

July 17, 2019

Jimmy,

State Chemical pricing for 55 gallons for both Nutri Pro and Pit Raider for the City of Murfreesboro for the fiscal year of 2019/2020 is as follows. During this time period there will be no price increases on the product.

The price per product will be as follows:

Pit Raider D55 delivered price of \$1406.10

Nutri Pro D55 delivered price of \$399.50

Please feel free to contact me if you have any questions and as always it is a pleasure working with your team.

Best Regards,

Sherri Johnson
Territory Manager
615-972-5196 cell

Craig Adams
District Sales Manager
State Industrial Products
865-386-8553



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MEMORANDUM

DATE: July 15, 2019

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: Sewer Easement Abandonment
Hastings Family – Florence Road

Background

This easement abandonment request is from Shane Hastings, partial owner of the property along Florence Road encumbered with the easement. The Family is requesting the abandonment of the existing 20-foot sanitary sewer easement. This easement was recorded in May of 2017 and was intended for a proposed sewer forcemain easement which was to be installed to serve the new Shelton Square Subdivision. During the design and review stage of the project, Mr. Bob Parks purchased this easement from the Hastings, however, when staff submitted the project to the Tennessee Department of Transportation (TDOT) for review and approval of the sewer forcemain crossing of I-24, TDOT required the design of the forcemain to change and to cross I-24 further to the north. Therefore, this easement is no longer necessary.

Recommendation

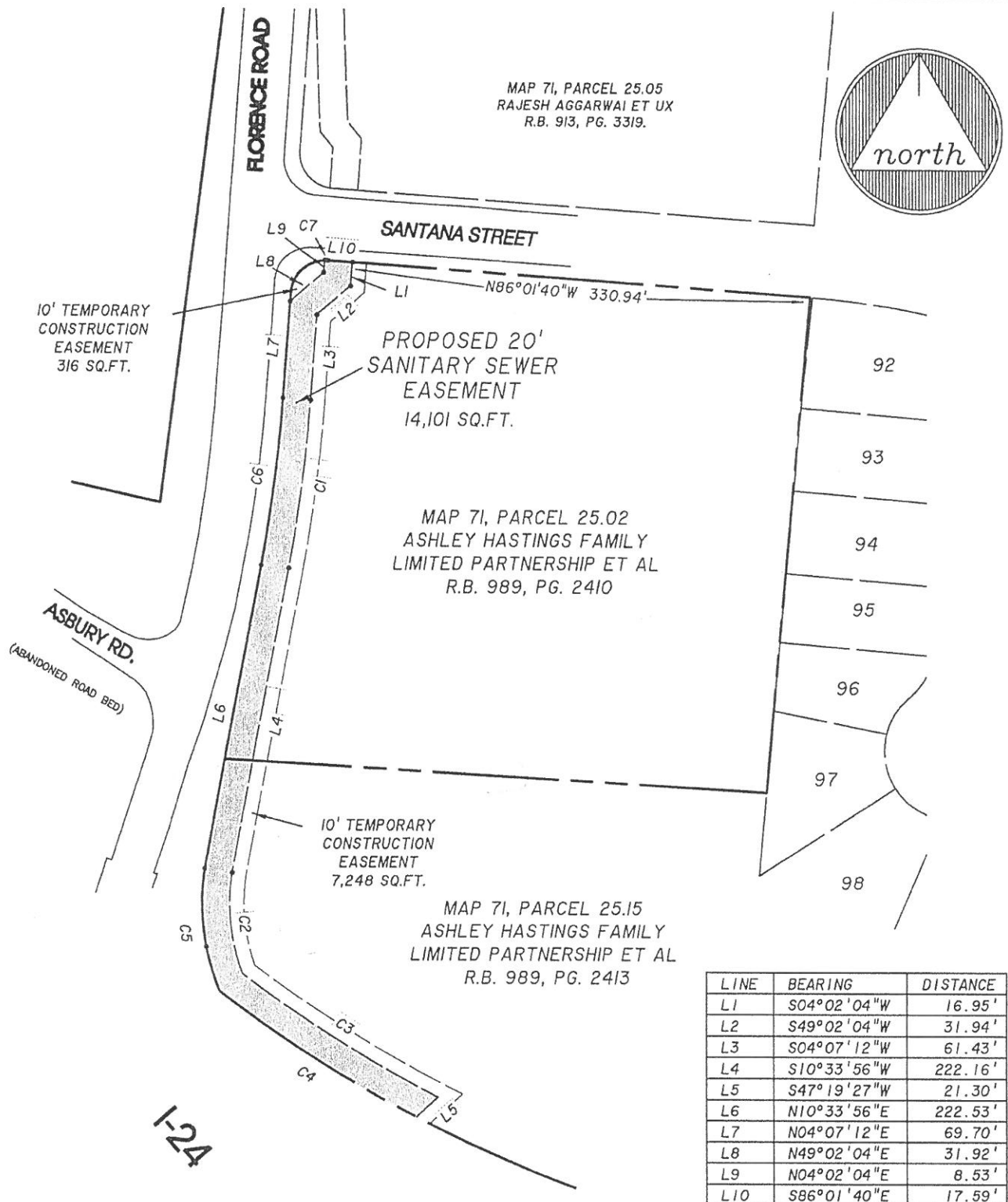
Staff recommends that the Board recommend to the Planning Commission and City Council approval of abandoning this existing sewer easement.

Fiscal Impact

Not applicable. The easement was purchased by the developer.

Attachment

Easement Abandonment Exhibit



LINE	BEARING	DISTANCE
L1	S04°02'04"W	16.95'
L2	S49°02'04"W	31.94'
L3	S04°07'12"W	61.43'
L4	S10°33'56"W	222.16'
L5	S47°19'27"W	21.30'
L6	N10°33'56"E	222.53'
L7	N04°07'12"E	69.70'
L8	N49°02'04"E	31.92'
L9	N04°02'04"E	8.53'
L10	S86°01'40"E	17.59'

CURVE	DELTA	RADIUS	LENGTH	TANGENT	CHORD	CHORD BEARING
C1	6°26'45"	1100.00'	123.75'	61.94'	123.68'	S07°20'34"W
C2	28°24'51"	150.00'	74.38'	37.97'	73.62'	S05°49'22"E
C3	10°07'51"	940.17'	166.24'	83.34'	166.02'	S57°52'42"E
C4	10°01'52"	960.17'	168.11'	84.27'	167.89'	N57°29'17"W
C5	30°34'38"	170.00'	90.72'	46.47'	89.65'	N06°46'19"W
C6	6°26'45"	1080.00'	121.50'	60.81'	121.44'	N07°20'34"E
C7	5°32'23"	25.00'	2.42'	1.21'	2.42'	S88°47'14"E

EXHIBIT MAP
 PROPOSED SANITARY SEWER EASEMENT
 MAP 71, PARCELS 25.02 & 25.15
ASHLEY HASTINGS FAMILY LIMITED PARTNERSHIP ET AL
 RECORD BOOK 989, PAGE 2410 & RECORD BOOK 989, PAGE 2413
 CITY OF MURFREESBORO - 7TH CIVIL DISTRICT
 RUTHERFORD COUNTY, TENNESSEE
 DATE 4-13-17 SCALE 1"=100'

SEC, Inc. SITE ENGINEERING CONSULTANTS
 ENGINEERING • SURVEYING • LAND PLANNING

15302 850 MIDDLE TENNESSEE BLVD • MURFREESBORO, TENNESSEE 37129
 PHONE: (615) 890-7901 • FAX: (615) 895-2567



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MEMORANDUM

DATE: July 17, 2019

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: Pump Station (PS) #09 Replacement
& Sewer Rehabilitation along Ransom Drive
Final Balancing Change Order

Background

In May 2015, the Board approved the Engineering necessary for the design to replace the existing Ransom Drive Pump Station (PS#9) and forcemain as well as some gravity sewer main replacement. Bids were received on June 13, 2017 for the pump station replacement and brought to the Board at the June 2017 meeting with the recommendation to reject the bids. The project rebid in May 10, 2018 and was awarded to SBW Constructors, LLC in the amount of \$934,832**.

At the January 2019 meeting the Board approved of the use of a portion of the Miscellaneous Allowance through a Work Directive. It was approved to use \$5,174 of the \$10,000 Allowance amount. The project is now complete and Civil Infrastructure Associates (CIA) has sent a recommendation letter and final balancing change order for approval.

Even with the use of the Miscellaneous Allowance, the contract amount will be reduced by a total of \$73,219.75 for a final contract amount of \$861,612.25.

Recommendation

Staff recommends that the Board recommend to City Council approval of this final balancing change order.

Fiscal Impact

This construction project was programmed into the Department's 5-year capital improvement plan last year in the amount of \$650,000; however, it was adjusted to \$850,000 after the initial bids were received.

Attachments

CIA Recommendation
Final Change Order Form

** We discovered a typo in the original memo to award the project dated May 17, 2018. The award amount was listed as \$934,836 but should have been shown as 934,832.

Water Resources Department

300 NW Broad Street * P.O. Box 1477 * Murfreesboro, TN 37133-1477 * Office: 615 890 0862 * Fax: 615 896 4259
TTY 615 848 3214 * www.murfreesborotn.gov

July 17, 2019

Ms. Valerie Smith, P.E.
Assistant Director, Murfreesboro Water and Sewer Department
220 NW Broad Street
Murfreesboro, TN 37130

RE: Ransom Drive Gravity Sewer and SPS Replacement
Proposed Change Order #1 (final balancing change order)
Recommendation Letter
MWSD Project No: 15068, CIA Project No: 2015-10

Dear Valerie:

Attached are four (4) copies of proposed Change Order #1 for the referenced project. The purpose of this change order is to reconcile the actual quantities installed with the quantities bid and to document use of the Miscellaneous Allowance that was part of the bid items.

1. Miscellaneous Allowance Use (Bid Item 13 - \$10,000):
 - a. Existing pole broke during construction, replacement pole and other miscellaneous associated items: Work Directive #1 for \$5,174.70.
 - b. Additional fence removals and replacements related to property owners chicken coop: \$6,012.49.
 - c. Sewage Pump Station gate size increase to 25 foot to allow better access for vacuum truck, site arrangement changed when the electric pole was relocated: \$925.

Total of actual miscellaneous quantities: \$12,112.19

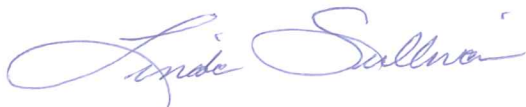
2. Final Balance of Installed Quantities vs Contract Sum:

Pay Request #6 reflects the complete project.

Contract Amount (Bid Price)	\$934,832.00
PR#6:	<u>\$861,612.25</u>
Net change in Contract Price:	-\$73,219.75

If you have any questions, please call.

Sincerely,



Linda Sullivan, PE, President
CIA – Civil Infrastructure Associates, LLC

Pc: Valerie Smith, Asst. Director MWRD
Jeremie White, Project Manager SBW Constructors

PROJECT:

Ransom Dr Sewer and SPS Replacement
 Murfreesboro Water Resources Department
 220 NW Broad Street
 Murfreesboro Tennessee 37130

CHANGE ORDER NUMBER: 1 (final balancing)**DATE OF ISSUANCE:** July 2019**ENGINEER PROJECT NO:** 2015-10**TO:**

SBW Constructors
 C/O Mr. Jeramie White
 405 Church Street
 Goodlettsville, TN 37072

ENGINEER:

Civil Infrastructure Associates, LLC
 Linda Sullivan, P.E.
 307 Hickerson Drive
 Murfreesboro, TN 37129

The contract is changed as follows (See attached sheets for additional detail):

1. Balance final quantities, bid vs installed (deduct from contract sum) \$-73,219.75

Original Contract Sum was \$934,832.00

Net change by previous authorized Change Orders \$0.00

The Contract Sum prior to this Change Order was \$934,832.00

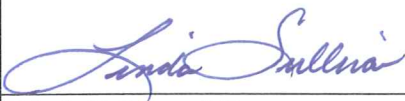
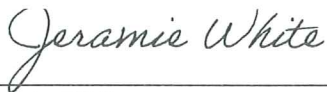
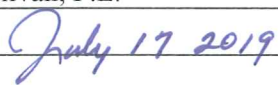
The Contract Sum will be (decreased) by this Change Order..... \$73,219.75

The New Contract Sum including this Change Order \$861,612.25

The Date of Final Completion is July 12, 2019.

Authorized:

Engineer: Linda Sullivan, P.E. Civil Infrastructure Associates, LLC 307 Hickerson Drive Murfreesboro, Tennessee 37129	Contractor: SBW Constructors, LLC. 405 Church Street Goodlettsville, Tennessee 37072	Owner: MWRD 220 NW Broad Street Murfreesboro, Tennessee 37130
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Linda Sullivan, P.E.	Jeramie White	Shane McFarland, Mayor
Date 	Date	Date

July 17, 2019

Valerie H. Smith, PE
Assistant Director
Murfreesboro Water & Sewer Department
220 NW Broad Street
Murfreesboro, TN 37130

RE: Ransom Drive Sewer and Pump Station Replacements
SBW Constructors, LLC – Pay Request #6

Valerie:

The MWSD inspector has verified the quantities and CIA has double checked the math within pay request #6 and we find the amount of work stated in the pay request to be complete and in accordance with the contract documents.

CIA recommends that \$102,808.86 be paid to SBW Constructors, LLC and that an additional 5% retainage (\$5,410.99) be put in an interest bearing account.

PR#1 - \$7,839.75 retainage previously held
PR#2 - \$5,750.17 retainage previously held
PR#3 - \$9,476.30 retainage previously held
PR#4 - \$9,345.90 retainage previously held
PR#5 - \$5,257.50 retainage previously held
PR#6 - \$5,410.99 retainage recommended be held this pay period

If you have any questions, do not hesitate to call.

Sincerely,



Linda J Sullivan, P.E.
President, CIA Engineers, LLC

Pc: Ms. Valerie Smith, MWRD
Mr. Jeramie White, SBW

CERTIFICATE OF THE CONTRACTOR OR HIS DULY AUTHORIZED REPRESENTATIVE

To the best of my knowledge and belief, I certify that all items, unit quantities, and prices of work and materials shown on the face of Sheet 1 of this Periodical Estimate are correct and all work has been performed and materials supplied in full accordance with the terms and conditions of the corresponding construction contract documents between the undersigned as Contractor and the City of Murfreesboro Water and Sewer as Owner, dated 7/12/19, and all authorized changes thereto; that the following is a true and correct statement of the contract amount up to and including the last day of the period covered by this estimate and that no part of the "Total Amount Due" has been received:

Original Contract Amount		\$ 934,832.00
Plus/Minus Approved Change Orders:		
No. _____	Dated: _____	
No. _____	Dated: _____	
No. _____	Dated: _____	
No. _____	Dated: _____	
No. _____	Dated: _____	
No. _____	Dated: _____	
No. _____	Dated: _____	
No. _____	Dated: _____	
Total Contract Amount to Date		\$934,832.00

(a)	Amount Earned To Date	\$ 861,612.25
	Stored Materials	-
(b)	Total Amount Earned	\$ 861,612.25
	Retainage: 5%	\$ 43,080.61
	Less Retainage Held in Escrow Account	
	Current Retainage Held By Metro Water	
(c)	Total Earned Less Current Retainage Held by Metro	\$ 818,531.64
(d)	Less Total Previously Approved for Payment & Escrow	\$ 715,722.78
(e)	Liquidated Damages	-
(f)	Bonus For Early Completion	
(g)	TOTAL AMOUNT DUE THIS ESTIMATE	\$ 102,808.86

I further certify that all claims outstanding as of this date against the undersigned as Contractor for labor, materials, and expendable equipment employed in the performance of said contract up to this date have been paid in full accordance with the requirements of said contract

PROJECT NAME: Ransom Drive Sewer Replacement

ESTIMATE NUMBER: 6 (Final)

Purchase Order Number:

PROJECT NUMBER: 15068

DATE: 5/1/2019 thru 7/11/2019

Contract Number:

CONTRACTOR: SBW Constructors, LLC

BY: Clint A. Maye

TITLE: Project Manager

ENGINEER'S CERTIFICATE FOR PAYMENT

I certify that I have verified this Periodical Estimate and that to the best of my knowledge and belief it is a true and correct statement of work performed and materials supplied under the Contract and that the Contractor's certified statement of his account and the amount due him is correct and just, and that all work and materials included in this periodical estimate have been performed in full accordance with the terms and conditions of the corresponding construction contract documents and authorized changes thereto.

NAME:

NAME: CIA - Civil Infrastructure Assoc, LLC

BY:

DATE:

BY:

APPROVED AND PAYMENT RECOMMENDED:

OWNER'S RECOMMENDATION FOR PAYMENT

OWNER:

DATE:

BY:

TITLE:

JOB NAME: Ransom Drive Sewer Replacement
Project No: 15068

CONTRACTOR: SBW Constructors, LLC
107 Terry Ln
Cottonwood, TN 37048

PAY ESTIMATE NO. 6-15068
FOR PERIOD FROM 01-May-19 TO 11-Jun-19

Amount Remaining

ITEM NO.	DESCRIPTION	CONTRACT QUANTITY	UNIT	UNIT PRICE	CONTRACT AMOUNT	APPROVED QUANTITIES		CURRENT AMOUNT	AMOUNT TO DATE
						CURRENT	PREVIOUS		
1	Site Mobilization, erosion control, construction access roads, Temp. Facilities, Traffic Control, Sewer Bypassing & Misc Slewwork not included below	1	LS	\$ 40,000.00	\$ 40,000.00	0	1.00	\$ -	\$ 40,000.00
2	10" CL 350 DIP Gravity Sewer 6-8' Outside Roadway, in existing trench	71	LF	\$ 237.00	\$ 16,827.00	0	64.00	\$ -	\$ 15,168.00
3	4 ft Dia Manhole 6-8' deep w/watertight	1	EA	\$ 5,500.00	\$ 5,500.00	0	1.00	\$ -	\$ 5,500.00
4	Line Existing Manhole (Exoxy) Foreman Entry Location	1	EA	\$ 3,750.00	\$ 3,750.00	0	1.00	\$ -	\$ 3,750.00
5	4" HDPE Force Main - Outside Roadway Pipe Bursting	475	LF	\$ 100.00	\$ 47,500.00	0	0.00	\$ -	\$ -
6	4" HDPE Force Main - Inside Roadway Pipe Bursting	100	LF	\$ 100.00	\$ 10,000.00	0	0.00	\$ -	\$ -
7	Ductile Sewage Lift Station, complete & operable, including site work, fence, all associated electrical, controls, Pump Station, Driveway Paving as Residential Collector	385	EA	\$ 420,000.00	\$ 420,000.00	0.15	0.85	\$ 63,000.00	\$ 420,000.00
8	Reconnect existing gravity sewer to proposed manhole	1	SY	\$ 110.00	\$ 42,350.00	225	0.00	\$ 24,750.00	\$ 420,000.00
9	Permit Fees Allowance	1	EA	\$ 5,000.00	\$ 5,000.00	0	1.00	\$ -	\$ 5,000.00
10	Landscaping Allowance (For Landscaping around pump station only)	1	LS	\$ 35,000.00	\$ 35,000.00	0.95	0.05	\$ 2,850.00	\$ 150.00
11	Demolition - Existing Pump Station, including removing existing pump equipment and deliver to owner or	1	LS	\$ 10,000.00	\$ 10,000.00	0	1.00	\$ -	\$ 35,000.00
12	Misc. Allowance	1	LS	\$ 35,000.00	\$ 35,000.00	1.21	1.21	\$ 12,112.19	\$ 14,886.00
13	4" HDPE FM - Open Cut - Inside Road	10	LF	\$ 150.00	\$ 1,500.00	0	127.00	\$ -	\$ 14,886.00
14	4" HDPE FM - Open Cut - Outside Roadway	30	LF	\$ 110.00	\$ 3,300.00	0	0.00	\$ -	\$ -
15	Concrete Encasement	20	CY	\$ 55.00	\$ 1,100.00	0	0.00	\$ -	\$ -
16	Undercut with Crushed Stone Backfill ASTM #57	1	LF	\$ 90.00	\$ -	0	0.00	\$ -	\$ -
1	4" HDPE FM - Open Cut - Inside Road	1	LF	\$ 85.00	\$ -	0	0.00	\$ -	\$ -
2	4" HDPE FM - Open Cut - Outside Road	1	LF	\$ 85.00	\$ -	0	0.00	\$ -	\$ -
3	Mobilization, EPSC, Access Road, Temp. Facilities, traffic control, sewer bypass pumping, misc site work	1	LS	\$ 37,000.00	\$ 37,000.00	0	1.00	\$ -	\$ 37,000.00
1a	8" CL 350 DIP Gravity Sewer 6-8' deep, Outside Roadway	592	LF	\$ 200.00	\$ 118,400.00	0	564.00	\$ -	\$ 112,800.00
1b	10" CL 350 DIP Gravity Sewer 6-8' deep, Outside Roadway	176	LF	\$ 265.00	\$ 46,640.00	0	163.00	\$ -	\$ 43,195.00
1c	4ft Dia MH 6-8ft deep	3	EA	\$ 5,700.00	\$ 17,100.00	0	3.00	\$ -	\$ 17,100.00
1d	Wateright MH Covers	3	EA	\$ 550.00	\$ 1,650.00	0	3.00	\$ -	\$ 1,650.00
1e	Reconnect Sewer Services, including wye, 45 degree bend, 6 inch DIP, and cleanout w/box	25	CY	\$ 55.00	\$ 1,375.00	0	11.89	\$ -	\$ 653.40
1f	Type "F" Gravel Driveway Repairs	8	CY	\$ 1,500.00	\$ 12,000.00	0	0.00	\$ -	\$ -
1g	Type "D" Concrete Pavement Repair	100	LF	\$ 16.00	\$ 1,600.00	0	0.00	\$ -	\$ -
1h	Chain Link Fence Repair/Replacement	100	EA	\$ 85.00	\$ 8,500.00	0	0.00	\$ -	\$ -
1i	Block Retaining Wall Repair/Replacement	2	EA	\$ 5,280.00	\$ 10,560.00	0	2.00	\$ -	\$ 10,560.00
1j	Reconnect Existing Gravity Sewer to new system	2	SY	\$ 97.00	\$ 194.00	36.78	0.00	\$ 5,507.66	\$ 5,507.66
1k	Repair/Replacement paving for asphalt driveway damage	250	SY	\$ 97.00	\$ 24,250.00	36.78	0.00	\$ 5,507.66	\$ 5,507.66
					\$ 934,832.00			\$ 108,219.85	\$ 981,612.25



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MEMORANDUM

DATE: July 17, 2019
TO: Water Resources Board
FROM: Darren Gore
SUBJECT: Reclassification Request – Worker to Equipment Operator

Summary

As a result of a resignation last fiscal year and an accompanying voluntary demotion from an Equipment Operator to a Worker, staff is requesting the Board to allow reinstating the Equipment Operator position for the Operations and Maintenance division.

Recommendation

Reclassify a Worker job classification to Equipment Operator.

Background Information

Darryl Williams was an Equipment Operator working the Jordan and Coleman Farm irrigation operations. He was transferred to Operations and Maintenance in June of 2017, maintaining his position as Equipment Operator working on a Vacuum truck.

In July of 2018, Mr. Williams voluntarily requested a demotion to a Worker position which allowed him to drive a dump truck at O&M. In August of 2018, Mr. Williams resigned from the Department.

His original position as Equipment Operator was never replaced and the reclassification from his vacant Worker position to an Equipment Operator was not included as part of the Department's FY20 budget.

Fiscal Impacts

An Equipment Operator is one pay grade above a Worker position which equates to a 5% increase in wages on average. The total fiscal impact is anticipated to be less than \$2,000 to the annual payroll budget and will most likely result in a decrease due to replacing a mid-range Worker position with an entry level Equipment Operator.



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MEMORANDUM

DATE: June 17th, 2019
TO: Water Resources Board
FROM: John Strickland
SUBJECT: FY20 WRRF Chemical Renewal - Sodium Hypochlorite

Background

Invitations to Bid on chemicals for use at the Water Resource Recovery Facility (WRRF) were advertised and released on May 12th, 2017. Bids were publicly opened on May 30th, 2017 in the WRRF Conference Room at 2:00 p.m. CST. Staff reviewed the bid submissions and determined the lowest responsible and responsive bidder.

With the approval of the Board and the Council, Dycho Company Inc. was contracted through FY19 to supply Sodium Hypochlorite. The contract included the option for renewal for additional one-year terms.

Recommendation

Staff recommends that the Water Resources Board recommend to City Council approval of a one-year contract extension for the purchase of Sodium Hypochlorite from the lowest bidder as referenced below.

Supplier	Chemical	Price/Gallon	Estimated Annual Expense
Dycho Company Inc.	Sodium Hypochlorite	\$0.855	\$75,000

Fiscal Impact

The expense for the product is reflected in the 2019-20 Operating Budget. The contract price will be good through June 30, 2020.

Attachment

Contract Extension Letter



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March 15, 2019

The Dycho Company, Inc.
J. Robert Shamblin
412 Meridian Street
Niota, TN 37826

Re: Sodium Hypochlorite

Dear Mr. Shamblin:

On May 30, 2017 we publicly opened bids for water/wastewater treatment chemicals to use at the Murfreesboro Water Resource Recovery Facility. Section 1.3.4 of the bid documents states **"The successful bidder shall provide the chemical(s) as specified. Pricing shall be effective for the term of the contract, which is through June 30, 2018 with the option to renew for up to three additional one-year terms."** As June 30, 2019 approaches, the City of Murfreesboro is exercising its option to renew your contract for an additional year as specified in the bid documents. In order to participate, your price will have to remain at the bid price with no increase through **June 30, 2020**. If you do not accept this renewal, the City will need to re-bid your contract. Your current bid price is **\$0.855 per gallon for Sodium Hypochlorite 12.5%**. *

Please sign where indicated and return to me before **April 5, 2019** if you accept the renewal by the City. If you have any questions, please feel free to give me a call at (615) 848-3225.

Sincerely,

John Strickland
Plant Manager, Water Resource Recovery Facility

* per the agreement between
Mr Shamblin + Mr Strickland
to supply 80,000 gals for
the period 7/1/19 - 6/30/20

We agree to extend the contract for one year.

The Dycho Company, Inc.

By: J.R. Shamblin

Printed Name

[Signature]
Authorized Signature

Title: Pres. & C.

Date: 4-3-19

PRO-FORMA INVOICECUSTOMER NO.

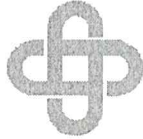
10401

DATE

04/03/19

NUMBER

67040301

**The Dycho Company, Inc.**

P O Box 513
 Niota, TN. 37826 USA
 Phone: (423) 568-2112 Fax: (423)568-2116

SOLD TO:

Murfreesboro Water & Sewer Department
 P.O. Box 1477
 Murfreesboro, TN 37133-1477

SHIP TO:

Murfreesboro Sinking Creek WWTP
 2032 Blanton Drive
 Murfreesboro, TN 37129

<u>CUSTOMER PO / REL NO.</u>	<u>F.O.B.</u>	<u>SHIPPED VIA</u>	<u>SALES AGENT</u>	<u>TERMS</u>
71900003	Delivered	Vender Preference	JC	Net 30 Days

<u>UNITS</u>	<u>PACKAGE</u>	<u>DESCRIPTION</u>	<u>TOTAL QUANTITY</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
80,000	1 Gal Bulk	Sodium Hypochlorite 12.5%	80,000 gals	\$0.855/gal	\$68,400.00
Merchandise Total:					\$68,400.00
Fuel Surcharge:					\$ 0
Net Due:				PLEASE PAY THIS AMOUNT	\$68,400.00

*** NO DEDUCTIONS WITHOUT AUTHORIZATION FROM DYCHO ***

PLEASE REMIT TO:

The Dycho Company, Inc.
 P.O. Box 513
 Niota, TN. 37826

A Service charge of 1.5% per month which is an annual rate of 18%, or the highest rate of interest allowed by law, whichever is less, will be added to all accounts if not paid by maturity.



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MEMORANDUM

DATE: July 18, 2019
TO: Water Resources Board
FROM: Donald Hughes
SUBJECT: Precast Manhole - Contract Renewal

Background

On July 12, 2018 bids were opened at Operations & Maintenance to provide precast manhole structures to Murfreesboro Water Resources Department. Two vendors submitted bids and the contract was awarded to the lowest bidder, Foley Products.

Recommendation

The contract with Foley Products expires August 31, 2019. Staff is pleased with the services provided by Foley Product's and recommends the Board recommend to City Council to extend the agreement. The contract may be renewed, by mutual written agreement, for two additional two-year periods for a maximum of 5 years at the option of the City. Foley has agreed to extend the contract and the legal department is drafting the amendment.

Fiscal Impact

The Operations and Maintenance Department uses an estimated 10 precast manhole structures on sewer projects yearly with an estimated cost of \$13,000. All terms and conditions of the contract will remain the same.



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MEMORANDUM

DATE: July 18, 2019
TO: Water Resources Board
FROM: Donald Hughes
SUBJECT: Unifirst Contract Renewal

Background

The department entered into a new contract with Unifirst through NJPA. The length of the contract was from January 4, 2016 to August 17, 2019 with the option to extend through 2020.

Recommendation

Staff is pleased with the services provided by Unifirst and recommends the Board recommend to City Council to extend the agreement through August 17, 2020.

Fiscal Impact

Uniform pricing information is outlined below and there is no price increase due to increased volume or a longer contract term. All terms and conditions of the contract will remain the same.

Uniform Type	Contract
Standard Work Uniform	\$3.33
Dress Uniform	\$3.99
Standard Work Uniform (Cotton)	\$4.46
Cotton Shirt & Denim Jeans	\$6.50

The annual budget for uniforms at O&M is approximately \$13,500.

Attachments

Letter of Agreement to Extend the Contract

Letter of Agreement To Extend the Contract

between

UniFirst Corporation (Vendor)
68 Jonspin Road
Wilmington, MA 01887

and

Sourcewell, Formerly National Joint Powers Alliance (NJPA)
202 12th Street NE
P.O. Box 219
Staples, MN 56479
Phone: (218) 894-1930

The Vendor and Sourcewell have entered into an Agreement (Contract #062415-UFC) for the procurement of Uniforms and Uniform-Related Products and Services. This Agreement has an expiration date of August 18, 2019, but the parties may extend the Agreement for one additional year by mutual consent.

The parties acknowledge that extending the Agreement for another year benefits the Vendor, Sourcewell and Sourcewell's Members. The Vendor and Sourcewell therefore agree to extend the Agreement listed above for a fifth year. This existing Agreement will terminate on August 18, 2020. All other terms and conditions of the Agreement remain in force.

Sourcewell, Formerly National Joint Powers Alliance® (NJPA)

DocuSigned by:

By: C0FD2A139D06489..., Its: Director of Operations & Procurement/CPO

Name printed or typed: Jeremy Schwartz
11/16/2018 | 12:38 PM CST

Date _____

UniFirst Corporation

DocuSigned by:

By: 4F12ACE1C3F841F..., Its: vp national accounts

Michael Ruttner
Name printed or typed: _____

11/16/2018 | 1:57 PM CST

Date _____

MINUTES
MURFREESBORO WATER RESOURCES BOARD
May 28, 2019

The Murfreesboro Water Resources Board met on Tuesday, May 28, 2019 in the conference room at the Operations and Maintenance Building, 1725 S. Church Street. Present at the meeting were Board members: Mr. John Sant Amour, Dr. Al Carter, Mr. Ron Crabtree, Mr. Brian Kidd, Ms. Sandra Trail, and Ms. Madelyn Scales-Harris. Also present were Darren Gore, Valerie Smith, Doug Swann, Michele Pinkston, Anita Heck, David Ives, Steve Tate, Matt Powers, Donald Hughes, Alan Cranford, Joe Russell, John Strickland, Jay Bradley, Ronnie Martin, and Haley Pelham along with other members of the public.

Item B was removed from the Consent Agenda.

Items A, C, and D of the Consent Agenda were presented for the following considerations:

A. Consider O&M Kubota Tractor purchase –

This unit will be used to pull the trailer jetter along sewer easement lines to clean and maintain the lines. It will also be used to help maintain the easements.

Staff researched various tractors of similar type and decided the Kubota Utility Cab Tractor was the best fit for the Department. It is included on the Sourcewell Contract through Murfreesboro Kubota, LLC.

Staff recommended the Board recommend to the City Council to approve the purchase of the tractor in the amount of \$48,71.65 from Murfreesboro Kubota. Funding for the purchase of the tractor was approved within the 2018/2019 Rate Funded Capital Budget for \$65,000.

C. Consider Lenahan Leasing Subdivision sewer participation –

In March of this year, staff received the Lenahan Leasing Company Subdivision preliminary plat for review. The plat was to create Lot 3 in the west corner of Middle Tennessee Blvd and Haley Road. It was sent for staff review to determine how the property would be served with water and sanitary sewer since City Code states that the developer is responsible to extend water and sewer services to each new lot that is created.

During review of the plat, it was determined that water service will be provided by a connection along Haley Road and sewer service will be provided by a public sewer main extension from the west by the developer across the original Lenahan Subdivision property. There is not an existing sewer main along Haley Road.

The original Lenahan Leasing Subdivision created Lot 1 at a time that did not require the developer to extend public water and sewer services to each new property created. It was through our sewer

rehabilitation efforts that we determined Lot 1 sewer service is a private sewer service extending through the original property and connects to the existing public sewer main to the north of the property.

The Department has an opportunity to bring this Lot 1 property in compliance with the requirement of public sewer to each lot of record. Since the developer is required to extend public sewer to Lot 3, staff has requested the developer to continue the extension of the 8" public sewer main from the newly created Lot 3 over to serve the existing Lot 1 which is approximately 144 linear feet. The Department would fully fund this 144-foot portion of the sewer extension. At such time in the future there are any improvements to the existing Lot 1, the Department will require Lot 1 to relay a new service line to this new public sewer main and to abandon the connection to the private sewer on the original property.

Staff has received an estimate from Huddleston Steele Engineering in the amount of \$17,300 for the additional 144 feet of sewer to extend from Lot 3 to Lot 1 along the western property line of Lot 3.

Staff recommended the Board recommend to City Council approval of the funding for the sewer extension. Funding is requested to come from the Department's working capital reserves.

D. Consider renewal of Memorandum of Understanding with MTSU –

Public education and participation are a core requirement of the State-issued stormwater discharge permit under which the City of Murfreesboro operates. The City's annual report to TDEC includes a record of the outreach and education done during the year.

In 2011, the City and MTSU entered into a Memorandum of Understanding (MOU) for MTSU to do education projects for us related to stormwater and surface water quality. We have continued with the MOU by annual renewals since 2012.

Each year MTSU and the City agree on a set of projects and events. These include education and outreach targeted to selected businesses or properties (for example, adjacent a stream); activities (TV spots, stream clean-up events, tree-planting, audits of facilities and follow-up education, etc.); classroom teaching; and setting up and staffing outreach events (Earth Day, school field days, etc.). Projects vary from year to year based on program needs and goals.

Staff would like to renew the MOU without changes and recommended that the Board recommend to City Council renewal of the MOU.

The 2019-20 fiscal year budget included \$50,000 for education services and would be paid out of stormwater funds.

A motion was made by Dr. Carter to accept Items A, C, and D of the Consent Agenda as presented and it was seconded by Brian Kidd. The Board voted unanimously to approve.

Item B removed from the Consent Agenda was discussed and voted on as an individual item.

B. Consider SSR Engineering Task Order 17-41-029.0 Amendment No. 1, Walter Hill Dam Rehab–

Staff first brought this project to the Board in December 2017. The project originated following the Tennessee Department of Environment and Conservation (TDEC) Division of Water Resources inspection of the dam. The original scope of the project was to provide repairs to reduce leakage at the dam/rock interface and extend the wall at the southeast end of the dam. The original contract with SSR proposed an hourly not-to-exceed fee of \$46,485.

SSR was involved in an extensive and lengthy review process with the United States Army Corps of Engineers (USACE) due to land ownership questions and concerns for endangered species in the project area. The additional information, coordination, and time required to receiving permit approval from the USACE was not budgeted in the original engineering services contract between MWRD and SSR. In addition, SSR was required to advertise and bid the project two times as the first bid resulted in no bidders. Additional contract document preparation was required for the second bid as well as a second pre-bid meeting and bid opening.

Above average rainfall in the second half of 2018 also caused delays for the contractor preventing him from completing the project within the contract period. A stop work order was then issued to the contractor from the Department on December 21, 2018. Per the request of the Tennessee Wildlife Resources Agency (TWRA), instream construction activities were prohibited from January 15 to July 1 due to the spawning period of an endangered species found near the project location. Although construction ceased, coordination between the contractor, MWRD, and SSR continued during this period regarding site clean-up, site access, and permit updates.

SSR is requesting an additional \$21,695 as an amendment to the original engineering services contract as the stop work period end date is approaching and construction activities should start soon. This fee covers the services previously rendered that were not accounted for in the original contract and covers time required for the resident project representative services through the completion of the project on September 13, 2019 (weather permitting).

The original agreement for engineering services of \$46,485 and the additional \$21,695 for the amendment for a total agreement of \$68,180. Funding for this project is to come from working capital reserves.

Staff recommended the Board recommend to the City Council approving Amendment 1 with SSR for the Walter Hill Dam rehabilitation.

A motion was made by Brian Kidd to accept Item B of the Consent Agenda as presented and it was seconded by Dr. Carter. The Board voted unanimously to approve.

The April 30, 2019 Board Minutes were unanimously accepted as presented.

The Board considered bids for repurified PVC pipe to extend repurified line at the Coleman Farm.

Operations & Maintenance requested sealed bids for 3,000 ft of 24" repurified pipe. This pipe will be utilized to extend the existing repurified line located at the Coleman Farm. The table below shows the bid results.

Project: Extend Repurified Line at Coleman Farm	
Company	Total
Fortiline Waterworks	\$143,640
Hayes Pipe	\$145,920
Southern Pipe & Supply	\$178,800
Core & Main	\$180,000
G&C	\$182,550

Staff recommended the Board recommend to City Council approval of purchasing pipe from the low bidder, Fortiline.

The funding for the extension of the repurified line in the amount of \$143,640 is to come from the Department's Working Capital Reserves.

Dr. Carter made a motion to approve. Ron Crabtree seconded. The motion unanimously passed.

The Board considered additional funding for emergency bypass pump due to a collapsed pipe.

Operations & Maintenance was alerted on February 28th an overflow occurred on a 36" interceptor. Research began immediately and on March 1st the blockage area was located. O&M started cleaning debris from the pipe and on March 2nd staff determined the pipe was collapsed.

O&M gathered quotes from three contractors who could quickly provide bypass pumping capabilities to stop overflows upstream until the pipe could be repaired. Garney Companies provided the lowest quote at \$45,351. The contractor set up the necessary pumping equipment on March 8th. Staff obtained a separate quote to repair the 36" interceptor and Garney was also the lowest. On March 18th, staff entered into a separate contract with Garney to perform the repair in the amount of \$215,000 but not to exceed \$250,000. Garney estimated the repair would take 12 days to complete; however, due to unforeseen circumstances encountered during the installation process, an extra two weeks was required. This in turn, required an additional two weeks of bypass pumping that generated an excess cost of \$21,454. The repair was completed on April 18th.

The total cost of the emergency repair is in the amount of \$314,055. Staff is requesting additional funds of \$21,454 to cover the extra two weeks of bypass pumping to be allocated from Capital Reserves.

Staff recommended the Board to recommend the City Council to approve the final payment of \$21,454 to Garney Companies.

Brian Kidd made a motion to approve. Sandra Trail seconded. The motion unanimously passed.

The Board considered Water/Wastewater Electrical/Mechanical Services Contract Extension.

Staff accepted bids on February 21, 2018 for one base-bid task order (18-01) along with supplemental unit prices for outside labor and equipment services. The bid was awarded to John Bouchard and Sons Co. (JB&S), and the agreement was executed on May 17, 2018. The agreement allowed for the provision of extending the supplemental unit prices an additional three, 12-month terms. Staff is requesting approval to extend the agreement with JB&S an additional 12 months to May 17, 2020.

Staff has been extremely satisfied with JB&S. They have been able to complete work MWRD maintenance staff could not due to lack of resources.

Staff recommended the Board recommend to the City Council to extend the agreement with John Bouchard & Sons Co. for an additional 12-month period from May 17, 2019 to May 17, 2020.

A lot of the costs associated with John Bouchard's help can be classified as reactive maintenance due to unforeseen repairs and equipment breakdowns and will likely be requested as funded from working capital reserves. However, the Department's 5-yr capital improvements plan does account for \$1.5M in rate funded vehicle and equipment replacement that may fund a portion of the costs associated with JB&S services.

Ron Crabtree made a motion to approve. Sandra Trail seconded. The motion unanimously passed.

The Board considered Buchanan/Elam Special Sanitary Sewer Assessment District boundary revision.

In July 2001 the City created the Buchanan/Elam Sanitary Sewer Assessment District (AD) by Ordinance and thereafter the Department extended sanitary sewer to the Buchanan and Elam Road Interchanges. By contract between the City and Farrer Bros. Construction, the Farrer's were obligated to make 100 sewer connections per year (at \$1,000 each for 20-yr) to help pay for the cost of this extension. Therefore, any connection made within this AD would be credited toward the Farrer's obligation.

The main development within this AD has been along the Joe B Jackson Parkway corridor and there have been two substantial single-family residential developments. One of these being the Buchanan Estates Subdivision developed by the Farrer's.

Over the years, staff has received requests to develop properties in the Buchanan Interchange area, outside of the City Limits as well as outside of the defined AD boundary/area. However, those developments have never been constructed. In March 2016, the Board and Council approved an Amendment No. 2 to our Policies, Procedures & General Design Requirements (Policy). A portion of this Policy in summary states in order to have sanitary sewer service, the property must be within the City Limits currently or annexed into the City. If the property is not annexable, service as an outside the city customer may be possible by written agreement under the following utility extension policy:

- 1) Only properties within the Buchanan and Elam Road Interchange Sanitary Sewer Assessment District, as defined in City Code Section 33-206 will be considered for outside the City sewer service, and
- 2) Only properties may be considered outside the City sewer customers where providing sewer services is deemed a higher benefit to the public than annexation affords (e.g., parks, schools, etc.).

In the last couple of months, staff received two requests that we determined didn't necessarily meet Amendment No. 2 to the Policy however, were viable candidates to be added to the AD Boundary.

The first is property along Rucker Road, approximately 19.75 acres. It is requested for this property be added to the AD to provide access to the Stonebridge Subdivision, which is currently within the AD. This proposed access is also a planned access on the Rutherford County Major Thoroughfare Plan to improve the roadway pattern of Rucker Road.

Staff originally received a request to develop this Subdivision in 2006 but due to the economic downturn it didn't happen. The developer has also either purchased or is under contract to purchase the property below the subdivision. Staff felt it was appropriate to recommend the property be included to provide road frontage to the land-locked development and serve a higher purpose in conforming to the County's major thoroughfare plan. Additionally, the number of lots to be sewered on this property is considered de minimis in depleting the capacity of the collection and treatment systems.

The second property is along Elam Road. It is currently owned by the New Bethel Church and is approximately 1 acre. Joe Swanson, Jr., wishes to purchase the property as a second access for the property he owns to the north which is being developed under the name of Parkway Place. There is an existing access now connected to Elam Road and extends parallel to I-24; however, Rutherford County Highway Department wishes to close this section of roadway paralleling I-24 and allow access solely through the church property. Staff believes this addition to the Buchanan Assessment district therefore serves a higher purpose and is de minimis in depleting capacity in the collection and treatment system.

Staff recommended the Board recommend to the City Council to approve the two properties be added to the Buchanan/Elam Sanitary Sewer Assessment District Boundary as Amendment No. 1.

Ron Crabtree made a motion to approve. Sandra Trail seconded. The motion unanimously passed.

Staff presented and discussed the Water Resources Dashboard Performance for April 2019.

Staff presented the Financial Reports for the year ending April 2019.

There being no further business, the meeting was adjourned.



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MEMORANDUM

DATE: July 15, 2019
TO: Water Resources Board
FROM: Valerie H. Smith
SUBJECT: Sanitary Sewer Rehabilitation
Award of Contract
Project File #18043

BACKGROUND

At the December 6, 2018 Board meeting the Board approved the Engineering, Construction Administration & Resident Inspection necessary for this next sanitary sewer rehabilitation project with S&ME.

This project includes 168 linear feet of open cut sewer main replacements, 17,240 linear feet of cured in place pipe (CIPP), lining and/or repairing 136 manholes which is approximately 1335 vertical feet of manhole lining and 170 sewer lateral linings. The design is complete and bids were received on July 11th.

Two bids were received out of a total of five possible prime contractors. A recommendation from S&ME along with the bid tabulation is attached. S&ME recommends awarding the project to SBW Constructors, LLC (SBW) in the amount of \$3,842,301. They were the lowest responsible and responsive bidder for the project, they also were the contractor on the two previous rehabilitation projects and were very good to work with.

RECOMMENDATION

Staff recommends that the Board recommend to the City Council awarding the contract to SBW in the amount of \$3,842,301.

FISCAL IMPACT

Funding for the Engineering, Construction Administration, Inspection and Construction was approved from a combination of 2018/2019 and 2019/2020 Budget & Working Capital Reserves. The Department has not dipped into these fiscal years for the rehab funding to date. We have been working from the 2017/2018 Budget & Reserves allotments.

Rehab Rate Funded Budget (\$1M) & Working Capital Reserves (\$1.5M) 2018/2019				
Total	WO#	Project	Project Expenditure	Remaining 2018/2019 Budget
\$2,500,000	X094	2019 Sewer Rehab Eng. & Inspect	\$432,000	\$2,068,000
	TBD	2019 Sewer Rehab Eng. & Inspect	3,842,301	(\$1,774,301)
Rehab Rate Funded Budget (\$1M) & Working Capital Reserves (1.0M) 2019/2020				
Total	WO#	Project	Project Expenditure	Remaining 2019/2020 Reserves
\$2,000,000				\$225,699

ATTACHMENTS

S&ME Recommendation
 Bid Tabulation



July 15, 2019

Ms. Valerie Smith, PE
Assistant Director
Murfreesboro Water & Sewer Department
220 NW Broad Street
Murfreesboro, TN 37130

RE: Recommendation of Award – 2019 Murfreesboro Rehabilitation Project

Dear Ms. Smith:

Bids for the 2019 Rehabilitation Project were received on July 11, 2019. Although only two bids were submitted for the project, there was positive participation in the bidding process from around the country as eight (8) prime contractors picked up plans and with five (5) attending the mandatory pre-bid meeting.

SBW Constructors, LLC, was the apparent low bidder in the amount of \$3,842,301.00. One discrepancy was noted on SBW's bid tabulation which did not influence their total bid price. In line item 2h, SBW input \$9,500 as a subtotal for that quantity; however, \$9,000 is the correct subtotal for that line item. The total bid price listed in their bid package was tabulated as if they had input the correct subtotal for item 2h. A correction was made in the attached certified bid tab. A review of the other documents included within the bid package were found to be in order.

SBW Constructors, LLC has recently completed several projects with Murfreesboro Water Resource Department with satisfactory results, two of which were similar size and scope. Additionally, as required in the bid package, each bidder was to submit a list of major subcontractors such that references could be verified. Each of the subcontractors have also performed work for Murfreesboro Water Resource Department with satisfactory results. SBW Constructors, LLC, is recommended as the successful, responsive, and responsible low bidder for the project. A tabulation of the bids is attached for your use.

If you concur with our recommendation, please provide formal notice from the board authorizing the award of the contract to SBW Constructors, LLC. Once approval is granted, we will notify the contractor of the award and will transmit the conformed documents to them for execution and attachment of bonds and insurance.

Sincerely,

S&ME, INC.

A handwritten signature in blue ink that reads "Travis E. Wilson".

Travis E. Wilson, PE
Principal Project Manager

Attachment – Certified Bid Tabulation

**Murfreesboro 2019 Sanitary Sewer Rehabilitation Project -
BID OPENING DATE 7-11-19**

Item No.	Description	Estimated Qty	Unit	SBW Bid		Insituform Bid	
				Unit Prices	Total Prices	Unit Prices	Total Prices
1	21-Inch Gravity Sewer						
a	10.5 mm CIPP	335	LF	\$119.00	\$39,865.00	\$100.00	\$33,500.00
b	12 mm CIPP	1,947	LF	\$122.00	\$237,534.00	\$148.00	\$288,156.00
c	13.5 mm CIPP	1,787	LF	\$126.00	\$225,162.00	\$149.00	\$266,263.00
d	15 mm CIPP	1,048	LF	\$130.00	\$136,240.00	\$167.00	\$175,016.00
e	16.5 mm CIPP	959	LF	\$134.00	\$128,506.00	\$180.00	\$172,620.00
f	Mainline Sewer Point Repair at Service Connection 18-foot to 24-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to Existing Lateral Line - Unpaved	1	Each	\$25,000.00	\$25,000.00	\$16,300.00	\$16,300.00
g	Mainline Sewer Point Repair at Service Connection 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to Existing Lateral Line - Paved	1	Each	\$30,000.00	\$30,000.00	\$17,550.00	\$17,550.00
h	Service Lateral Repair - CIPP connection only (up to 3 linear feet)	2	Each	\$7,200.00	\$14,400.00	\$4,500.00	\$9,000.00
i	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 12-foot to 18-foot Depth	4	Each	\$5,200.00	\$20,800.00	\$10,620.00	\$42,480.00
2	18-Inch Gravity Sewer						
a	9 mm CIPP	966	LF	\$100.00	\$96,600.00	\$110.00	\$106,260.00
b	10.5 mm CIPP	369	LF	\$115.00	\$42,435.00	\$165.00	\$60,885.00
c	12 mm CIPP	481	LF	\$125.00	\$60,125.00	\$165.00	\$79,365.00
d	PVC SDR 26 Mainline Sewer Open Cut Replacement From Access Point to Access Point - 18-foot to 24-foot Depth	90	LF	\$390.00	\$35,100.00	\$350.00	\$31,500.00
e	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	8	Each	\$6,800.00	\$54,400.00	\$4,975.00	\$39,800.00
f	Service Lateral Repair - CIPP connection only (up to 3 linear feet)	2	Each	\$5,600.00	\$11,200.00	\$4,000.00	\$8,000.00
g	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 0-foot to 6-foot Depth	1	Each	\$3,500.00	\$3,500.00	\$4,100.00	\$4,100.00
h	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 6-foot to 12-foot Depth	2	Each	\$4,500.00	\$9,000.00	\$5,200.00	\$10,400.00
i	Service Lateral Replacement - Open Cut up to 25-Linear Feet, 12-foot to 18-foot Depth	1	Each	\$4,700.00	\$4,700.00	\$6,700.00	\$6,700.00
j	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 18-foot to 24-foot Depth	1	Each	\$6,500.00	\$6,500.00	\$9,500.00	\$9,500.00
k	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	Each	\$4,700.00	\$4,700.00	\$7,450.00	\$7,450.00
l	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	1	Each	\$6,800.00	\$6,800.00	\$10,200.00	\$10,200.00
3	15-Inch Gravity Sewer						
a	9 mm CIPP	377	LF	\$80.00	\$30,160.00	\$120.00	\$45,240.00
b	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	5	Each	\$6,000.00	\$30,000.00	\$4,700.00	\$23,500.00
c	Service Lateral Repair - CIPP connection only (up to 3 linear feet)	2	Each	\$4,600.00	\$9,200.00	\$3,500.00	\$7,000.00
d	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 0-foot to 6-foot Depth	1	Each	\$3,000.00	\$3,000.00	\$4,100.00	\$4,100.00
e	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 6-foot to 12-foot Depth	1	Each	\$6,000.00	\$6,000.00	\$5,000.00	\$5,000.00
f	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 12-foot to 18-foot Depth	1	Each	\$7,000.00	\$7,000.00	\$6,400.00	\$6,400.00
g	Mainline Sewer Point Repair 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	Each	\$6,000.00	\$6,000.00	\$8,650.00	\$8,650.00
h	Mainline Sewer Point Repair 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	1	Each	\$11,000.00	\$11,000.00	\$12,200.00	\$12,200.00
i	Abandon Entire Mainline in Place	700	LF	\$8.00	\$5,600.00	\$52.00	\$36,400.00
4	12-Inch Gravity Sewer						
a	9 mm CIPP	611	LF	\$56.00	\$34,216.00	\$70.00	\$42,770.00
b	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	1	Each	\$6,500.00	\$6,500.00	\$4,700.00	\$4,700.00
c	Service Lateral Repair - CIPP connection only (up to 3 linear feet)	1	Each	\$5,000.00	\$5,000.00	\$3,500.00	\$3,500.00
d	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 0-foot to 6-foot Depth	1	Each	\$3,000.00	\$3,000.00	\$4,000.00	\$4,000.00
e	Mainline Sewer Point Repair 0-foot to 6-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	1	Each	\$3,800.00	\$3,800.00	\$5,700.00	\$5,700.00
5	10-Inch Gravity Sewer						
a	6.0 mm CIPP	1,186	LF	\$51.00	\$60,486.00	\$63.50	\$75,311.00
b	7.5mm CIPP	136	LF	\$77.00	\$10,472.00	\$95.00	\$12,920.00
c	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	7	Each	\$5,000.00	\$35,000.00	\$3,475.00	\$24,325.00
d	Service Lateral Repair - CIPP connection only (up to 3 linear feet)	4	Each	\$3,900.00	\$15,600.00	\$2,690.00	\$10,760.00
e	New Cleanout Installation	1	Each	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00
f	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 6-foot to 12-foot Depth	2	Each	\$3,500.00	\$7,000.00	\$4,400.00	\$8,800.00
g	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 12-foot to 18-foot Depth	1	Each	\$5,200.00	\$5,200.00	\$6,000.00	\$6,000.00
h	Mainline Sewer Point Repair at Service Connection 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to Existing Lateral Line - Paved	1	Each	\$14,000.00	\$14,000.00	\$12,750.00	\$12,750.00
i	Mainline Sewer Point Repair 0-foot to 6-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	1	Each	\$6,000.00	\$6,000.00	\$7,250.00	\$7,250.00
j	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	2	Each	\$7,500.00	\$15,000.00	\$9,170.00	\$18,340.00

Item No.	Description	Estimated Qty	Unit	Unit Prices	Total Prices	Unit Prices	Total Prices
6	8-inch Gravity Sewer						
a	6.0 mm CIPP	6,328	LF	\$47.00	\$297,416.00	\$60.00	\$379,680.00
b	7.5 mm CIPP	708	LF	\$48.00	\$33,984.00	\$60.00	\$42,480.00
c	Service Lateral Repair - CIPP connection and up to 25 Linear Feet	76	EA	\$4,900.00	\$372,400.00	\$3,425.00	\$260,300.00
d	Service Lateral Repair - CIPP Connection Only (Up to 3 Linear Feet)	21	EA	\$3,800.00	\$79,800.00	\$2,690.00	\$56,490.00
e	Internal CIPP Point Repair - 3-ft Sectional Liner	15	EA	\$4,700.00	\$70,500.00	\$3,500.00	\$52,500.00
f	Internal CIPP Point Repair - 12-ft Sectional Liner	1	EA	\$6,500.00	\$6,500.00	\$4,800.00	\$4,800.00
g	PVC SDR 26 Mainline Sewer Sectional Open Cut Replacement - 6-foot to 12-foot Depth (up to 50 linear feet) - Paved	3	EA	\$4,200.00	\$12,600.00	\$21,000.00	\$63,000.00
h	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 0-foot to 6-foot Depth	5	EA	\$3,600.00	\$18,000.00	\$3,900.00	\$19,500.00
i	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 6-foot to 12-foot Depth	10	EA	\$3,800.00	\$38,000.00	\$4,100.00	\$41,000.00
j	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 12-foot to 18-foot Depth	3	EA	\$5,200.00	\$15,600.00	\$5,200.00	\$15,600.00
k	Mainline Sewer Point Repair at Service Connection 0-foot to 6-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to Existing Lateral Line - Unpaved	1	EA	\$5,700.00	\$5,700.00	\$6,000.00	\$6,000.00
l	Mainline Sewer Point Repair at Service Connection 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to Existing Lateral Line - Unpaved	1	EA	\$5,800.00	\$5,800.00	\$7,650.00	\$7,650.00
m	Mainline Sewer Point Repair at Service Connection 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length and Connect to Existing Lateral Line - Paved	3	EA	\$8,700.00	\$26,100.00	\$10,000.00	\$30,000.00
n	Mainline Sewer Point Repair 0-foot to 6-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	3	EA	\$3,500.00	\$10,500.00	\$4,850.00	\$14,550.00
o	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	3	EA	\$4,300.00	\$12,900.00	\$5,700.00	\$17,100.00
p	Mainline Sewer Point Repair 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length - Unpaved	2	EA	\$8,500.00	\$17,000.00	\$7,800.00	\$15,600.00
q	Mainline Sewer Point Repair 0-foot to 6-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	1	EA	\$5,000.00	\$5,000.00	\$6,700.00	\$6,700.00
r	Mainline Sewer Point Repair 6-foot to 12-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	8	EA	\$7,000.00	\$56,000.00	\$8,800.00	\$70,400.00
s	Mainline Sewer Point Repair 12-foot to 18-foot Depth - Open Cut Repair up to 20 Feet in Length - Paved	1	EA	\$11,000.00	\$11,000.00	\$11,700.00	\$11,700.00
7	Service Laterals						
a	Pre CCTV Inspection of Service Laterals (All Mainline Diameters)	200	Each	\$350.00	\$70,000.00	\$200.00	\$40,000.00
b	Remove Intruding Lateral Tap or Gasket	25	Each	\$250.00	\$6,250.00	\$150.00	\$3,750.00
c	Dye Test Lateral	25	Each	\$200.00	\$5,000.00	\$400.00	\$10,000.00
d	Repair Service Lateral- CIPP Beyond 25-Linear Feet	750	LF	\$33.00	\$24,750.00	\$25.00	\$18,750.00
e	Replacement - 0 foot to 6 foot Depth Cut Beyond First 25-Linear Feet	75	LF	\$42.00	\$3,150.00	\$16.00	\$1,200.00
f	Replacement - 6 foot to 12 foot Depth Cut Beyond First 25-Linear Feet	50	LF	\$45.00	\$2,250.00	\$26.00	\$1,300.00
g	Replacement - 12-foot to 18-foot Depth Cut Beyond First 25-Linear Feet	50	LF	\$60.00	\$3,000.00	\$41.00	\$2,050.00
h	Replacement - 18-foot to 24-foot Depth Cut Beyond First 25-Linear Feet	25	LF	\$85.00	\$2,125.00	\$100.00	\$2,500.00
i	New Cleanout Installation	50	Each	\$950.00	\$47,500.00	\$1,500.00	\$75,000.00
j	Expose Existing Cleanout - 0 foot to 3 foot Depth and Install New Box - Unpaved	5	Each	\$1,000.00	\$5,000.00	\$1,000.00	\$5,000.00
k	Expose Existing Cleanout - 0 foot to 3 foot Depth and Install New Box - Paved	5	Each	\$1,200.00	\$6,000.00	\$1,500.00	\$7,500.00
8	4-Foot Diameter Precast Concrete Manholes						
a	0-8 Foot Depth	1	Each	\$5,000.00	\$5,000.00	\$6,400.00	\$6,400.00
b	8-16 Foot Depth	4	Each	\$9,300.00	\$37,200.00	\$10,500.00	\$42,000.00
9	6-Foot Diameter Precast Concrete Manholes						
a	16-24 Foot Depth	1	Each	\$80,000.00	\$80,000.00	\$40,000.00	\$40,000.00
10	Manholes - Surface Rehabilitation						
a	Raise Manhole to Grade	2	Each	\$2,100.00	\$4,200.00	\$2,300.00	\$4,600.00
b	Replace Frame and Cover	1	Each	\$900.00	\$900.00	\$830.00	\$830.00
c	Install Watertight Manhole Cover on Existing Manhole	2	Each	\$1,500.00	\$3,000.00	\$1,250.00	\$2,500.00
11	Manholes - Subsurface Rehabilitation						
a	Lining 48-inch Diameter Manhole	815	VF	\$340.00	\$277,100.00	\$250.00	\$203,750.00
b	Lining 60-inch Diameter Manhole	170	VF	\$385.00	\$65,450.00	\$295.00	\$50,150.00
c	Plug Abandoned Line at Manhole	1	Each	\$400.00	\$400.00	\$300.00	\$300.00
d	Prep and Reline Manhole Connection on Previously Lined Manholes	7	Each	\$650.00	\$4,550.00	\$500.00	\$3,500.00
e	Install New Manhole Invert and Bench	1	Each	\$850.00	\$850.00	\$600.00	\$600.00
f	Repair Existing Manhole Bench & Invert	1	Each	\$850.00	\$850.00	\$600.00	\$600.00
g	Abandon Entire Manhole in Place	3	Each	\$1,000.00	\$3,000.00	\$1,900.00	\$5,700.00
h	Install Inside Drop Bowl and Associated Piping	50	VF	\$325.00	\$16,250.00	\$255.00	\$12,750.00
i	Additional Penetration to Precast Manhole - 4-inch to 8-inch diameter pipe	2	Each	\$1,500.00	\$3,000.00	\$2,100.00	\$4,200.00
j	Lining 48-inch Diameter Manhole (Work Must Be Performed in Dry Weather Periods - September 2019-October 2019)	175	VF	\$383.00	\$67,025.00	\$295.00	\$51,625.00
12	Church Street Realignment						
a	PVC SDR 26 Mainline Sewer Open Cut Realignment	105	LF	\$400.00	\$42,000.00	\$300.00	\$31,500.00
b	Install New 4-foot Diameter Precast Concrete Manhole	1	Each	\$6,500.00	\$6,500.00	\$6,700.00	\$6,700.00
c	Replace Existing Manhole with New 4-foot Diameter Precast Concrete Manhole	2	Each	\$3,900.00	\$7,800.00	\$5,700.00	\$11,400.00
d	Service Lateral Replacement - Open Cut up to 25-Linear Feet - 6-foot to 12-foot Depth	4	Each	\$1,900.00	\$7,600.00	\$4,100.00	\$16,400.00
13	Pavement Removal and Replacement						
a	Asphalt	9,000	SF	\$15.00	\$135,000.00	\$15.00	\$135,000.00
b	Finished Concrete (Driveways/Sidewalks)	400	SF	\$28.00	\$11,200.00	\$20.00	\$8,000.00
c	Concrete (Curb & Gutter)	300	LF	\$60.00	\$18,000.00	\$51.00	\$15,300.00
d	Infrared Pavement Restoration	2,000	SF	\$8.00	\$16,000.00	\$9.50	\$19,000.00

Item No.	Description	Estimated Qty	Unit	Unit Prices	Total Prices	Unit Prices	Total Prices
14	Cash Allowances						
a	Soils and Concrete Testing	Allowance			\$2,000.00		\$2,000.00
b	Cured-In-Place Pipe Testing Laboratory Services	Allowance			\$6,000.00		\$6,000.00
15	Additional Work if Ordered by Owner/Engineer						
a	Crushed Stone	300	CY	\$35.00	\$10,500.00	\$20.00	\$6,000.00
b	Leak Stop In Manhole	300	Gal	\$350.00	\$105,000.00	\$350.00	\$105,000.00
c	Flowable Fill	200	CY	\$90.00	\$18,000.00	\$300.00	\$60,000.00
d	CIPP Lateral Transition Adder	100	Each	\$475.00	\$47,500.00	\$450.00	\$45,000.00
e	Heavy Cleaning for Service Laterals (All Diameters)	500	LF	\$11.00	\$5,500.00	\$10.00	\$5,000.00
f	Heavy Cleaning for Mainline (6-12 inch Diameter)	1,000	LF	\$6.00	\$6,000.00	\$0.10	\$100.00
g	Heavy Cleaning for Mainline (15-24 inch Diameter)	1,000	LF	\$10.00	\$10,000.00	\$0.10	\$100.00
h	Filter Fabric	200	SF	\$1.50	\$300.00	\$10.00	\$2,000.00
i	CCTV Inspection of 6-inch to 12-inch Sanitary Sewer Mainline	1,000	LF	\$2.00	\$2,000.00	\$1.00	\$1,000.00
j	CCTV Inspection of 15-inch to 18-inch Sanitary Sewer Mainline	1,000	LF	\$4.00	\$4,000.00	\$2.00	\$2,000.00
k	CCTV Inspection of 24-inch to 36-inch Sanitary Sewer Mainline	1,000	LF	\$6.00	\$6,000.00	\$3.00	\$3,000.00
l	Pre-Conditioning of 6-inch to 12-inch Sanitary Sewer Mainline	1,000	LF	\$1.50	\$1,500.00	\$1.50	\$1,500.00
m	Pre-Conditioning of 15-inch to 18-inch Sanitary Sewer Mainline	1,000	LF	\$6.00	\$6,000.00	\$2.50	\$2,500.00
n	Pre-Conditioning of 24-inch to 36-inch Sanitary Sewer Mainline	1,000	LF	\$6.00	\$6,000.00	\$5.50	\$5,500.00
Total Bid (Items 1-15):					\$3,842,301.00		\$3,983,766.00

I do certify that the above is a true and correct copy of the bids received.

Travis E. Wilson

S&ME, Inc - Travis E. Wilson, PE - Principal Project Manager





... creating a better quality of life

MEMORANDUM

DATE: July 19, 2019
TO: Water Resources Board
FROM: Darren Gore
SUBJECT: Walter Hill Dam Maintenance - Change Order No. 1

Summary Statement

Change Order No. 1 for the Walter Hill Dam Maintenance project is necessary to adjust the contract time from 60-day completion to a 347-day completion project, as well as add an additional \$75,505.55 to the original contract price of \$492,000. The time is necessary due to high flow conditions experienced in the East Fork Stones River (EFSR) last fall, and the additional cost is required due to underwater repair and maintenance work that is outside the original scope of the contract.

Recommendation

Approval of Change Order No. 1 which adds 287 days to the contract time and adds \$75,505.55 to the contract price to the Walter Hill Dam Maintenance Project.

Background

Attached is a memo from Smith Seckman Reid, Inc. (SSR) that goes into much more detail involving the necessity of the time and cost adjustment. I offer the following justification and recommendation to approve Change Order No 1:

- **Time** –September through December of 2018 were unseasonably wet and as such created much higher flows in the EFSR that disallowed Haren Construction from completing the dam maintenance project. Haren was issued a stop work order on December 21, 2018. The TN Wildlife Resource Agency and Corps of Engineers permit disallowed any work to occur instream within the river from January 15, 2019 through July 1, 2019 due to the spawning season of certain endangered species in the river. Haren has just remobilized and is starting work on the dam remediation activities and the extension of time is due primarily to the time frame that they were prohibited from working.
- **Cost** – The original scope of work involved lowering the water level behind the dam six feet. Lowering the water level this low renders the raw water pump station upstream of the dam nonoperational due to inability for the pumps to maintain suction. The auxiliary raw water pump station on the lake was intended to solely supply water to the plant when the water level was lowered; however, due to two Variable Frequency Drive (VFD) failures at the auxiliary raw water

[Water Resources Department](#)

300 NW Broad Street * P.O. Box 1477 * Murfreesboro, TN 37133-1477 * Office: 615 890 0862 * Fax: 615 896 4259
TTY 615 848 3214 * www.murfreesborotn.gov

pumping station, this station is effectively shut-down until the VFD's are replaced. The time frame for these replacements is 8 weeks. Staff considers this too long and puts us back into the same season as last year that created the higher flows prohibiting the dam remediation from occurring. As a least cost, least risk solution, Haren Construction has proposed to perform the work underwater with divers and not lower the water level behind the dam. This increased cost is \$75,505.55. Haren is leveraging an existing relationship to get the divers on the project as soon as possible. The quote from Zion Marine is attached. Please note there is 2.5% markup on this by Haren for the proposed increase in lieu of the standard 5% markup.

Fiscal Impact

The original bid for the Walter Hill Dam Maintenance contract was \$492,000. The additional cost of \$75,505.55 is a 15% increase. There is a \$15,000 contingency fund in the contract that could absorb some of the added cost, but staff would recommend keeping the contingency fund whole until the project is completed for other potential unforeseen costs. The additional funding is requested to come from the Department's working capital reserves.

Attachments

Proposed Change Order No. 1 and accompanying SSR Memo



July 19, 2019

Mrs. Valerie Smith
Assistant Director of Engineering
Murfreesboro Water Resources Department (MWRD)
220 NW Broad Street
Murfreesboro, TN 37130

**RE: Walter Hill Dam Maintenance
Murfreesboro, TN
Proposed Change Order No. 1**

Dear Mrs. Smith:

Attached is a copy of proposed Change Order No. 1. The following summarizes the change items and provides recommendation for their approval.

Change Order No. 1 was created to modify the contract time from 60 day substantial completion to a 347 day completion. The final completion will subsequently be adjusted from 90 days to 377 days. Heavy rain fall during the original 90 day project schedule prevented the Contractor from completing the entire scope of the project. A six-month stop work order was then issued to the Contractor on December 21, 2018 at the request of the Tennessee Wildlife Resources Agency (TWRA). The stoppage was requested to prohibit instream activities from January 15 to July 1 due to the spawning period of multiple endangered species found in the river near the project site. A resume work letter was issued to the Contractor with a revised start date of on or before July 15, 2019. The revised substantial completion date is September 13, 2019.

Change Order No. 1 also modifies the original contract amount via an increase of \$75,503.55 for the use divers to make underwater structural concrete repairs to the dam in lieu of the originally proposed coating method. The cost increase covers the mobilization, surface preparation, materials, and labor associated with using underwater structural concrete repair and underwater epoxy mastic coating. The original contract price was \$492,000.00 and if Change Order No. 1 is executed, the revised contract price will be \$567,503.55.

The cost increase is a result of the aforementioned unseasonable weather conditions and corresponding river flowrates which prevented the Haren Construction Company (the Contractor) from successfully isolating the location of the dam in need of repair using conventional dewatering methods. By using a diving contractor no further significant delays to the project will be incurred and the construction schedule will not be extended into in opportune periods of year in terms of weather (based upon previous experience of the Contractor). This option of concrete repair will provide the highest likelihood of success for quality and constructability.

The Contractor proposed siphoning the river pool down eight-feet (8') as an alternative method to dewater the dam and provide access to repair the dam. Lowering the pool that height would force MWRD to rely solely on the Auxiliary Raw Water Pump Station for their source of raw water as extreme low levels of the river do not provide adequate water depth for the main plant pump stations to operate. Unfortunately, this option is not currently possible as two of the three raw water pumps at the Auxiliary Intake are out of service as of last week. Two Variable Frequency Drives (VFD's) associated with two of the three raw water pumps at the Auxiliary Intake failed and repairs are not possible as the components in need of replacement are obsolete due to the age of the VFD's. Fortunately, the VFD's are scheduled to be replaced altogether but the replacement will not be complete for at least another eight weeks.

The option to wait for the replacement of the VFD's in order to perform the alternative dewatering method was considered however ultimately proved to not be a viable solution. The additional delay would force the Contractor to demobilize for the duration of the VFD replacement and the cost associated with demobilizing and remobilizing was roughly estimated by the Contractor at approximately \$88,000. The availability of the Contractor's subcontractors was also questionable due to the loose scheduling of VFD replacement and could potentially cause further delays to the completion of the project.

A third option was also analyzed that included delaying resuming the project until July 1, 2020 to ensure the Contractor plenty of "dry weather" to complete the job. The Contractor was ultimately not interested in extending the project another calendar year as it was not feasible as they have already absorbed costs associated with delaying the project to re-start in July 2019.

As part of the decision to use the divers to complete the concrete structural repairs, the following scope was also modified from the original scope of the project at no additional cost to the Owner. The Contractor shall provide coating on south side of dam in areas at or above water levels after ~1.5' draw down of river pool in lieu of full depth of wall to river bottom. The Contractor shall stop leakage (approximately four (4) locations) using pressure grout or similar means at existing stone wall area on south side of dam. The Contractor shall repair damage to the face of dam near the junction of rock wall/dam face. And the Contractor shall increase height of the proposed curb on south side to 12" in lieu of 6" as originally specified.

SSR has reviewed the proposed changes and recommends they be approved. Please review the enclosure and if acceptable to you, execute and forward one (1) signed copy to me.

If you have any questions, please feel free to contact me.

Sincerely,

SMITH SECKMAN REID, INC.



Luke G. Williams, PE
LGW/lgw
Enclosures

cc: Darren Gore (w/encl) - MWRD
Alan Cranford (w/encl) - MWRD

T:\Team41\2017\17410290\CA\Chg Order CCF\LGW20190718_LTR_WalterHill_CO1.doc

Date Issued:	July 18, 2019	Effective Date:	Date of Execution
Project:	Walter Hill Dam Maintenance	Contract No.:	N/A
Owner:	Murfreesboro Water Resources Department	Owner's Project No.:	N/A
Engineer:	Smith Seckman Reid, Inc.	SSR Project No.:	17-41-029.0
Contractor:	Haren Construction Co., Inc.	Government Project No.:	N/A

The contractor is hereby authorized and directed to make the changes described below, and agrees to furnish all labor, materials, and equipment to accomplish the changes in accordance with the applicable portions of the Contract Documents for this project.

Description of Change (Including Location and Reasons Therefore)

This change order, as part of the project, changes the project substantial completion date from 60 days to 347 days from the date of the original notice to proceed. The project final completion date is changed from 90 days to 377 days from original notice to proceed. Heavy rain fall during the original 90 day project schedule prevented the Contractor from completing the entire scope of work. A six month stop work order was then issued to the Contractor on December 21, 2018 at the request of the Tennessee Wildlife Resources Agency (TWRA) in order to protect multiple endangered species in the river during their breeding season.

The change order also includes a net change of \$75,503.55 to the original contract amount. Due to the aforementioned unseasonable weather conditions and corresponding high river flowrates, conventional dewatering methods were not successful in isolating the locations of the dam in need of repair, thus, a diving firm is needed to complete the remaining work in a timely and effective manner. The cost increase covers the mobilization, surface preparation, materials, and labor associated with using underwater structural concrete repair and underwater epoxy mastic coating.

The change order also includes the following scope modifications at no additional cost increase to the contract:

1. HCCI shall provide coating on south side of dam in areas at or above water levels after ~1.5' draw down of river pool in lieu of full depth of wall to river bottom.
2. HCCI shall stop leakage (approximately four (4) locations) using pressure grout or similar means at existing stone wall area on south side of dam.
3. HCCI shall repair damage to face of dam near junction of rock wall/dam face.
4. HCCI shall increase height of proposed curb added on south side to 12" in lieu of 6".

In executing this change order, it is mutually agreed that the amounts provided for herein will be accepted by the contractor as full compensation for all known costs associated in the work, including all direct and indirect costs, and any and all known costs associated with delays or additional time, if any, which may be required as a result of said changes.



SMITH
SECKMAN
REID, INC.

CHANGE ORDER NO. 1
WALTER HILL DAM MAINTENANCE
MURFREESBORO, TENNESSEE
JULY 18, 2019
(PAGE 2)

	AMOUNT		CONTRACT TIME
Original Contract Price	\$492,000.00	Substantial Completion Date Prior to Change Order	11/30/2018
Contract Price Prior to Change Order	\$492,000.00	Final Completion Date Prior To Change Order	12/31/2018
Net Amount This Change Order	\$75,503.55	Net Time This Change Order	287 days
Revised Contract Price	\$567,503.55	Revised Substantial Completion Date	09/13/2019

Recommended By:

Luke Willis

Engineer

07/18/2019

Date

Accepted By:

W. T. Huel

Contractor

7/18/19

Date

Approved By:

Owner

Date

Luke Williams

From: Bill Hall <bhall@harenconstruction.com>
Sent: Thursday, July 11, 2019 10:16 AM
To: Luke Williams
Cc: Kyle Gibson; Alison Partin
Subject: RE: MWRD Walter Hill

Follow Up Flag: Follow up
Flag Status: Completed

Luke

As you know, previously HCCI attempted to perform this work during times of excessive weather conditions & high river flows and were unable to dewater areas needed with the conventional means planned. During our last meeting to restart this work, the full drainage of river pool levels needed was not acceptable to the Owner and we discussed utilizing diver's instead.

HCCI has received and reviewed the quote from the diving firm, Zion Marine (ZM).

ZM's quoted work includes the following work for the powerhouse side [only] of project:

1. Crew/equipment mobilization costs, etc.
2. Providing the Five Star materials previously reviewed (up to 550 SF of surface area)
3. Provide 4 man diving crew with surface supplied diving equipment in accordance with OSHA / ADCI regulations & standards
4. Removal / disposal of the existing trash racks [2 jobs] and tree (if required)
5. Cleaning [high pressure water blast and/or Hand cleaning as necessary] of all surfaces to be repaired/coated in this area.
6. Install 3" layer of the Five Star Structural Concrete Underwater hand pack material on vertical concrete surfaces down from water level down to ground line.
7. Install the Five Star Splash Zone Underwater Epoxy Mastic Coating material [min. of 1/8" thick] over entire area of newly installed concrete coating.
8. There quote includes a unit cost of \$160 per SF of any additional area over the 550 SF estimated from the drawings
9. Can begin work in ~ 10 days of acceptance

In trying to be transparent in all costs for this work and after reviewing the costs for performing the concrete coating work on the powerhouse side of dam as originally planned there is a significant cost difference. The cost using Diver's is \$89,500.00 and the cost associated for the original work is \$9,400, plus the estimated costs associated with significantly lower river pool level is \$11,766.00. There would still be costs associated with lowering river pool levels to perform the other Dam top repairs and south side of river work, which HCCI estimates at \$5,328.

As for the other areas, per our discussions at last site meeting; 1) HCCI will provide coating on wall (south side of river dam) in areas at or above water levels [after the ~1.5' draw down of river pool] 2) HCCI will stop leakage [3-4 seepage leaks seen] at existing stone wall area [south side] 3) HCCI will repair the area of dam's face discussed at meeting at south end [at junction of rock wall/dam face] 4) HCCI will increase height of new curb added on south side to 12" in lieu of 6". HCCI will perform these four (4) items at no additional charge.

In an attempt to help lower costs, HCCI will forego standard mark-up for overhead/profit on this work and use a 2.5% mark-up to cover insurance and bonding.

HCCI proposes making these changes as noted above for the lump sum price of \$ 75,503.55.

Please review and let me know as soon as you can if this would be acceptable to you and the owner.

Thanks

Bill Hall
Haren Construction Company
O: 423-263-5561
M: 423-506-0384



101-A Indian Center Court

Kingsport, TN 37660

P: 423-343-5312

F: 423-398-5357

July 8, 2019

ZM18-P72_L01

Mr. Bill Hall
Haren Construction Company, Inc.
1715 North Highway 411
Etowah, TN 37331

Re: Proposal – Diving Services
Walter Hill Dam
Murfreesboro, TN

Mr. Hall:

Zion Marine, Inc. is pleased to provide you with our proposal for the above referenced project. The following paragraphs provide information on our services, fees, schedule, and other considerations.

A commercially certified dive crew with surface supplied diving equipment will be provided for all underwater portions of the work. All diving will be performed in accordance with Occupational Health & Safety Administration and the Association of Diving Contractors International regulations and standards.

Scope of Work

Zion Marine will provide all supervision, labor, materials and equipment to complete the scope of work. The scope of work includes concrete repairs and sealing to the vertical dam face on the powerhouse side of the dam.

Preparation

Zion Marine will remove the existing trash racks prior to beginning other work. All surfaces to be repaired with the Five Star Structural Concrete Underwater Hand Pack shall be cleaned using a high pressure water blast and hand cleaning as necessary in order to be free of marine growth, laitance, and other contaminants.

Concrete Installation

Zion Marine will install a three inch thickness of Five Star Structural Concrete Underwater Hand Pack on the vertical concrete surfaces down to the ground line. Potable water for mixing to be provided by client at the work site.

Epoxy Installation

Zion Marine will install Splash Zone Underwater Epoxy Mastic Coating by Five Star Marine with a minimum thickness of one-eighth inch covering the entire surface of the newly installed concrete.

Fees

Zion Marine will perform the above scope of work for the following fees:

<u>Item</u>	<u>Quantity</u>	<u>Unit</u>		<u>Cost</u>
Mobilization	1	Each	\$ 3,500	\$ 3,500
Removal of Trash Racks	1	LS	\$ 1,800	\$ 1,800
Cleaning of Existing Surfaces	1	LS	\$ 4,800	\$ 4,800
Installation of Underwater Structural Concrete	1	LS	\$ 33,900	\$ 33,900
Installation of Epoxy Top Coat	1	LS	\$ 14,000	\$ 14,000
Materials	1	LS	\$ 31,500	\$ 31,500
			Total	\$ 89,500

Schedule and Other Considerations

Per our conversations, this proposal is based on a repair area of 500 square feet. If the actual repair quantity is greater than 550 square feet, the additional area shall be billed at \$160.00 per square foot.

Client shall provide unimpeded access to work site. Haren Construction, or others, shall provide potable water for mixing at the work site as well as a forklift or similar for material handling.

We anticipate having the availability to begin within 10 days of receiving a notice to proceed.

If the scope and fees associated within this proposal are acceptable, a mutually agreed upon contract shall be executed. Proposal is valid for 45 days.

We appreciate the opportunity to provide you with our proposal and look forward to assisting you on this project. If you have any questions, or need additional information, please contact us anytime at (423) 343-5312.

Sincerely,



Joseph Templeton
Vice President



... creating a better quality of life

MEMORANDUM

DATE: July 18, 2019

TO: Water Resources Board

FROM: Darren W. Gore, Director

SUBJECT: Condemnation of Sanitary Sewer Easement
Lesieur, Armstrong Valley Rd.

Summary

Approve obtaining of a Sanitary Sewer Easement for the Armstrong Valley Road sewer project, Westwind Reserve, by condemnation.

Staff Recommendation

Approve condemnation, subject to a contract and indemnity agreement with the developer in form approved by the City Attorney.

Background Information

Cornerstone Development, LLC, the developer of Westwind Reserve, shown on the attached drawing, requires off-site sanitary sewer easements from three property owners. Two of them have been obtained by agreement. The third owner is willing to grant the easement but has a mortgage with a California lender with MERS as the lender's agent. The developer is concerned about the time that may be required to deal with MERS, and that ultimately the lender may not agree. This third owner does not object to condemnation. The developer will agree to bear all costs of the condemnation and will indemnify the City from any damage claim.

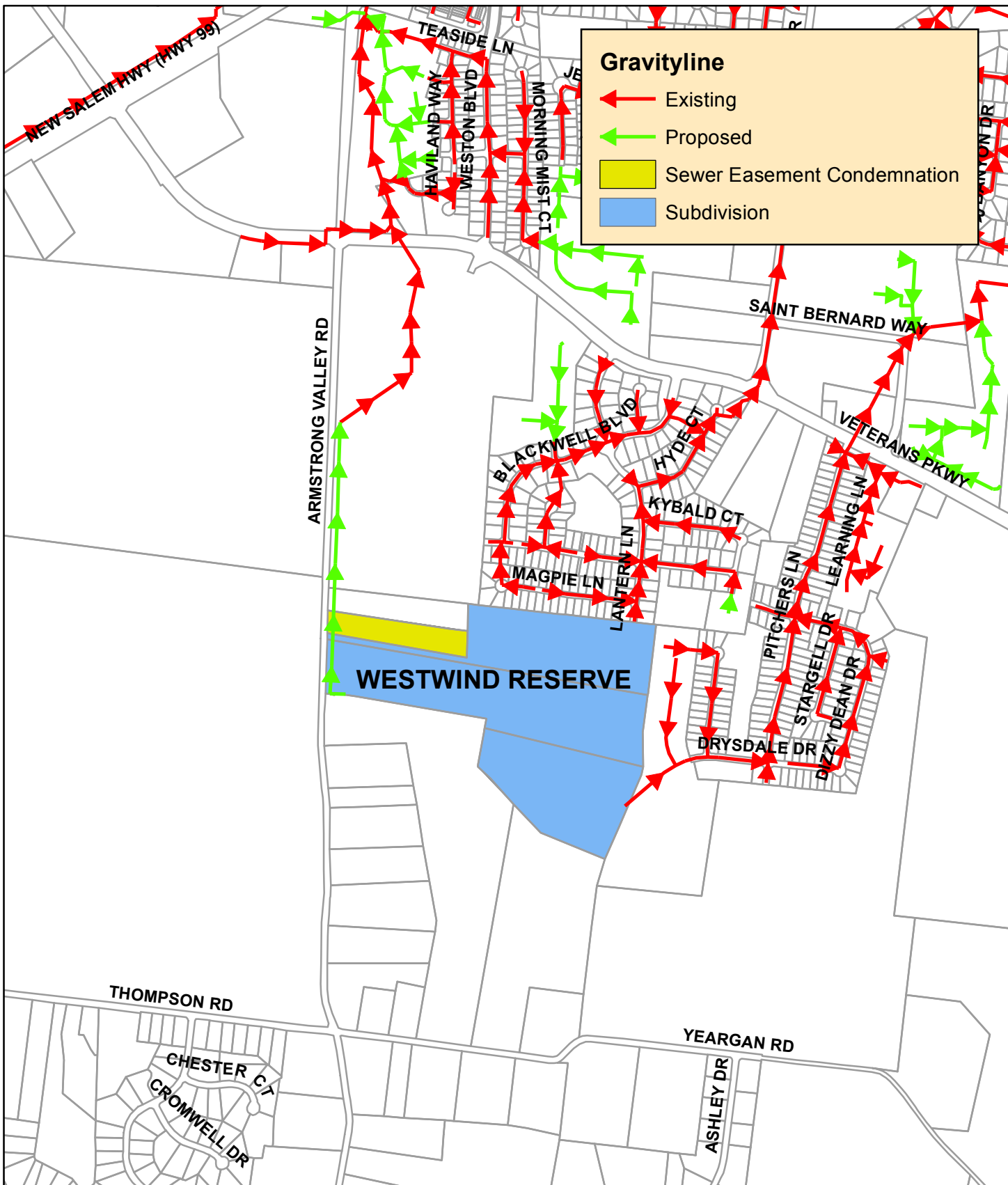
A portion of the sewer improvements that will be installed within these easements for this development are shown on the Departments 201 Wastewater Facilities Plan (Plan) and will serve a larger basin (Basin 97). The design of this sewer and associated costs are not finalized, but staff anticipates the developer to ask for participation in the near future, since staff in following the Plan has asked for a larger/deeper sewer main than necessary for the proposed development.

Fiscal Impacts

Future participation for a larger/deeper sewer main, but not known at this time.

Attachments:

Drawing of Armstrong Valley Road sanitary sewer extension and easement to be condemned.



MURFREESBORO WATER AND SEWER DEPARTMENT

LESIEUR SEWER EASEMENT CONDEMNATION





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MEMORANDUM

DATE: July 17, 2019
TO: Water Resources Board
FROM: Darren Gore, Director
SUBJECT: Testing of Hobas Pipe Involving Southwest Interceptor Failure

RECOMMENDATION

Approval for testing services by Applied Technical Services, Inc. to determine if structural failure of 36" Hobas pipe was due to deficiency in the original piping material.

BACKGROUND

In February 2019, a structural failure occurred on the Southwest Interceptor pipeline on the Hutchinson property. The Department expended \$314,055 in an emergency contract through Garney Construction to repair the failure and reinstate service through the interceptor. At that time, observers from MWRD, SSR and Garney all indicated that the installation of the pipeline and the backfill surrounding the pipeline were correct per the material specifications and the Contract Documents. There still remains some question as to whether the installed material met the original specifications provided by the material manufacturer, Hobas. In order to verify the mechanical properties of both removed sections of piping as well as those of the materials that were installed under the emergency repair, staff and SSR recommends specimens from both sets of materials be tested.

FISCAL IMPACT

The cost of testing is quoted at \$11,720. An additional \$1,000 is budgeted for shipping the pipe to their offices in Marietta, GA. Several materials testing vendors were solicited, and this is the best quote that staff was able to obtain. Funding is requested to come from working capital reserves.

ATTACHMENTS

SSR Memo dated 7/15/19 Hobas Pipe Testing from Southwest Interceptor
Applied Technical Services quote



PROJECT MEMORANDUM

Date: July 15, 2019

To: Darren Gore

From: Mike Bernard

RE: Hobas Pipe Testing from Southwest Interceptor

In February 2019, a structural failure occurred on the Southwest Interceptor pipeline on the Hutchinson property. The Department expended \$314,055 in an emergency contract through Garney Construction to repair the failure and reinstate service through the interceptor. At that time, observers from MWRD, SSR and Garney all indicated that the installation of the pipeline and the backfill surrounding the pipeline were correct per the material specifications and the Contract Documents. There still remains some question as to whether the installed material met the original specifications provided by the material manufacturer, Hobas. In order to verify the mechanical properties of both removed sections of piping as well as those of the materials that were installed under the emergency repair, we respectfully recommend that MWRD have specimens from both sets of materials tested. It has taken some time to find an independent testing laboratory that could handle 36" diameter pipelines, but we have now obtained a quotation from such a laboratory, namely Applied Technical Services, Inc. in Marietta, Georgia. That quotation is for \$11,720.00 and is attached for your consideration.

We believe that it is prudent for MWRD to expend this amount of money to determine whether or not there was a deficiency in the original piping material provided that led to the structural failure. Based on the results of this testing, it may also be prudent to further inspect other Hobas installations throughout the city to determine if excessive deflection has occurred. A February, 2019 news report from Bentonville, Arkansas indicated excessive deflection within segments of similarly sized Hobas pipe installed in their collection system. We believe that this testing is a necessary step in order to determine if the piping supplied to Murfreesboro in 2007 met the material specifications. We also believe that this testing is necessary to determine if Hobas should be utilized in future MWRD interceptor pipelines. We therefore respectfully request approval of this quotation and an allowance of \$1,000 to ship the piping to Marietta, Georgia.



Applied Technical Services

1049 Triad Court
Marietta, Georgia 30062
(770) 423-1400

Testing Protocol and Cost Estimate

Mechanical testing of ASTM D3262 Fiberglass Sewer Pipe

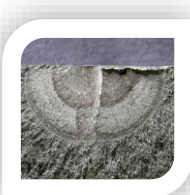
[Mechanical Testing](#)



[Metallurgy and Polymers](#)



[Failure Analysis](#)



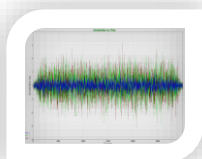
[Environmental Testing](#)



[Consumer Product](#)



[Vibration Testing](#)



[Weld Testing](#)



[Forensic Engineering](#)



[Chemistry](#)



Professional Engineers and Scientists: Design • Consulting • Testing • Inspection

In states where Applied Technical Services, Inc. does not provide engineering services, engineering services will be provided by ATS Engineering, (P)LLC or a licensed contractor.

**Date:** 7/11/2019**To:** Mike Bernard**Company:** Smith Seckman Reid**E-Mail:** mbernard@ssr-inc.com**Phone:** 615.460.0582**Quote Reference:** 19026350-2**Total Quoted:** \$11,720.00**Test/Service Description:** Mechanical testing of ASTM D3262 Fiberglass Sewer Pipe

Service Requested	Method	Price	Quantity	Total Price
Pipe stiffness Test setup and Fixtures	ASTM D2412	\$975.00/each	1	\$975.00
Pipe stiffness sample preparation	ASTM D2412-11	\$275.00/each	8	\$2,200.00
Pipe stiffness testing	ASTM D2412-11	\$225.00/each	8	\$1,800.00
Tensile Type I	ASTM D638-14	\$250.00/each	8	\$2,000.00
Machining (Tensile)	Per customer requirement	\$150.00/each	8	\$1,200.00
Compression	ASTM D695-15	\$250.00/each	8	\$2,000.00
Machining (Compression)	Per customer requirement	\$125.00/each	8	\$1,000.00
Analyst	Per customer requirement	\$160.00/each	2	\$320.00
Certify the Wall Thickness of Pipe	Per customer requirement	\$225.00/each	1	\$225.00
			Total:	\$11,720.00

Delivery Terms: Standard Delivery - 5-7 business days

Expedite Delivery - 2 business days

Expedite Service +50%

Urgent Delivery – 24 hour turnaround

Urgent Service +100%

*Turnaround time subject to equipment availability.

*Pricing contingent upon all samples arriving at the same time.

*Please include a copy of this quotation with shipped samples.

Notes: Fixture machining for pipe stiffness is 5-7 days. Testing will take place in ambient conditions, humidity is not controlled in the testing environment.

Prepared By: Diamond Hazel



Authorizing Agent: Jeremy Senn
Title: Group Supervisor
Phone: 678-444-2932
Cell: 678-215-6845
Email: jsenn@atslab.com

Quotation Accepted:

Authorized Signature

Date

By your signature above, you agree that the services provided by ATS are governed by the ATS General Conditions of Service. Any contradictory term in the Purchase Order or other Customer-provided document is expressly rejected by ATS.



- The test protocol is destructive in nature to the samples unless otherwise stated. Certain of the above costs have been quoted according to economy of sample size. Actual costs will be billed at quoted and published rates. The costs include a written, formal report of all test results if requested. This quote is valid for 30 days.
- Changes in scope must be re-quoted. Please use this document for the purposes of generating a purchase order number or other form of payment. We require a hard copy of a purchase order or credit card to proceed with the work. *Work cannot begin without a payment method.*
- Expedited services are available for an additional fee (if testing protocols allow).
- We appreciate the opportunity to provide your testing/inspection services and look forward working with you. Services provided will be governed by the Applied Technical Services, Inc. (ATS) General Conditions of Service. Services performed outside the scope of Applied Technical Services, Inc. (ATS) accreditations are certified to ISO 9001 requirements only.
- Shipment of samples can be made to authorizing agent's attention.
- Samples will be discarded 45 days after the completion of the project, *unless otherwise notated above, or* directed by the customer before that date.



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MEMORANDUM

DATE: July 18, 2019
TO: Water Resources Board
FROM: Darren Gore, Doug Swann
SUBJECT: CIS software upgrade

Background

In June 2014 MWRD went live with Advanced Utility Systems (AUS) Customer Information System (CIS) Infinity software, version 3 (V3). The implementation was a culmination of an almost two-year process, beginning with development of an Information Technology (IT) Strategic Plan in the fall of 2012.

Concurrent with the implementation of the CIS software, we launched online access for customers via Infinity.Link and moved from paper to digital with our Service Order system via Infinity.Mobile.

Replacing our legacy CIS software with state-of-the-art off-the-shelf software was the first step in our IT Strategic Plan. We followed up the CIS install with Interactive Voice Response (IVR) phone module in early 2015, new financial software (Tyler Munis) in July 2015, and Advance Metering Infrastructure (AMI) in June 2017.

CIS, Link and Mobile have all performed well. They have improved our staff and customer experience.

MWRD has now been using the software for five (5) years. Staff recommends upgrading to the latest version of the CIS and online access software. We will continue to use the Mobile module with the new versions.

Version 4 (V4) of CIS and Link offer several enhancements. Among them:

CIS.Infinity V4

- Greater customization of screens
- Improved ease-of-use for Customer Service
- Improved interfaces with 3rd party applications
- More powerful reporting
- More powerful querying of data
- Improved Graphical User Interface (GUI)
- Improved processes and related processing speeds

Water Resources Department

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www.murfreesborotn.gov/mwrld

Link.Infinity V4

Enhanced user experience through improved graphics

Improved data presentation

Additional online options allowing customers to conduct business with MWRD

Improved navigation for customers

V4 Fact sheet follows

Recommendation

Staff requests that the Board recommend to City Council approval to upgrade MWRD's CIS software and related online access module.

Fiscal Impact

The total estimated cost for the software update is \$343,000. This upgrade was originally budgeted in the FY19 Capital Expenditures at an estimated cost of \$300,000. As the purchase was not approved and secured in FY19, funding for this upgrade will come from MWRD Reserves in FY20.

CIS Infinity, Version 4

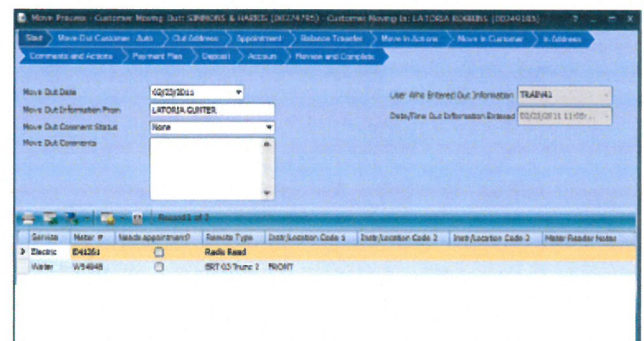
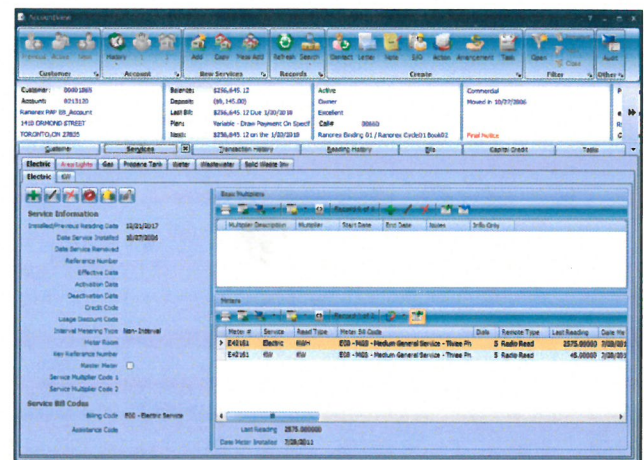
CIS Infinity, Version 4 is the next generation in customer information systems. Representing a significant technological upgrade, Version 4 is faster, more flexible and robust than any previous version.

Built using Microsoft .NET 4.5 with C#.NET as the core development language, Version 4 of CIS Infinity provides significant functional and technological benefits, including:

Key Features and Benefits:

- Run your key processes even faster than before
- Interface more powerfully and easily than before using AIM (Advanced Interface Manager)
- Access the data and information you need, when you need it
- Take advantage of our new Moves wizard
- Customize your searches with multi-item searching with the ability to go back to your results
- Create robust and powerful queries throughout CIS
- Reduces the size of your database
- Extend the capabilities of CIS Infinity using PowerShell so they align with your business processes
- Automate your system through actions - they are fully configurable at the utility level
- Customize the Help Wiki to include your specific business process information
- Use the dynamic Pre-Billing Exceptions Processing functionality to identify problems before you bill
- Design your service orders as easily as designing a letter
- Run the CIS Infinity Scheduler as a Windows service for more robust job scheduling
- Enjoy improved error handling and exception messaging
- Integrate with CIS Infinity in real-time using the fully exposed REST API
- Implement true role-based security at the business layer level
- Customize the layout of any screen with unlimited flexibility, including multiple layouts to best suit the needs of different groups of users
- Configure information bars for your functional groups on all main end-user forms

- Create your own bookmarks to display anything stored in CIS Infinity with the ability to include them in letters, service orders and information bars



Welcome to CIS Infinity Help

CIS Infinity is the best-in-class customer information and billing system for electric, water and natural gas utilities.

With CIS Infinity, you can control all aspects of your billing and customer service operations. CIS Infinity interfaces with accounting packages, report writers, meter reading systems and mapping software as well as spreadsheets, word processing and video-based applications.

With CIS Infinity, divisions within your utility can share historical information and comparative data in order to respond effectively to competition, market new products and services and build customer loyalty.

Copyrights and Trademarks

Table of Contents

- How to access CIS Infinity Online Help
- What's new in Version 4
- How to use CIS Infinity
- Customizing form layouts and applying security
- Managing criteria for filters and queries
- Searching for customers, accounts and forms
- Work with customers, accounts, services and more
- Moving Customers
- Billing Customers



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MEMORANDUM

DATE: July 18, 2019
TO: Water Resources Board
FROM: Darren Gore
SUBJECT: Waste Load Allocation Model Additional Cost Request

Summary Statement

The original Waste Load Allocation Model that was recommended by the Tennessee Department of Environment and Conservation (TDEC) and was intended to predict impacts of additional Murfreesboro Water Resource Recovery Facility (MWRRF) effluent into the West Fork Stones River (WFSR) has failed. As such, AquAeTer has had to abandon the original WLA Model known as Water Quality Analysis Simulation Program (WASP) and effectively start over using another model known as CE-QUAL-W2.

Starting over has added to the time and expense associated with the original \$303,500 task order approved in June of 2017. AquAeTer is requesting an additional \$75,000 to complete the WLA model and prepare the final report for TDEC's review.

Recommendation

Approval of additional \$75,000 to complete SSR Engineering Work Order 09-47-001.3.

Background

Staff met with the Tennessee Department of Environment and Conservation (TDEC) on June 5, 2017 and they approved the original work plan associated with the Waste Load Allocation. Staff has recently met again with TDEC on June 20, 2019 to review the failed results of the WASP model and gain their approval and buy-in to change the WLA model to CE-QUAL-W2.

In June 2013, the Board approved Smith Seckman Reid, Inc. (SSR) and AquAeTer to commence sampling of the East Fork and West Fork Stones River in support of renewing our existing NPDES permit application, introduce the option to TDEC for an additional outfall on the East Fork Stones River, and to demonstrate a favorable trend in biological health of the streams. The Board has approved annual bioassessment sampling since that time and the results have been outstanding.

The WLA model approved in June of 2017 is intended to be the technical foundation that demonstrates the more effluent discharged into WFSR, the more the WFSR is enhanced. The data demonstrates that the biology in the stream is healthy and that the stream is in fact meeting its designated uses.

Water Resources Department

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TTY 615 848 3214 * www.murfreesborotn.gov

The failure of the WASP model is an unfortunate setback, but the CE-QUAL-W2 is demonstrating very good prediction for the flow and temperature in the WFSR as illustrated in AquAeTer's attached memo.

AquAeTer has also provided me with a breakdown of their time associated with trying to "fix" the WASP model versus the time spent in CE-QUAL-W2. They are asking for an additional \$75,000; \$36,758 current cost overrun and an additional \$38,242 anticipated to complete the modeling and report.

Item		Hours	Cost
Original Proposal		524	\$62,133
Hours Expended		457 WASP 377 CE-QUAL-W2	\$98,891
		Current Overage	\$36,758
Remaining Estimate	Expense	322	\$38,242
		Total Added Costs	\$75,000

Fiscal Impact

The cost of the WLA was originally estimated to be \$303,500, and is currently being requested to increase by \$75,000, a 25% increase. Staff recommends funding coming from the Department's working capital reserves. MWSD's 5-yr CIP earmarked \$500,000 for Stones River Water Quality studies and NPDES permitting for FY19. Staff has budgeted an additional \$150,000 for FY20 through FY23. There are available funds to cover this added expense.

Attachments

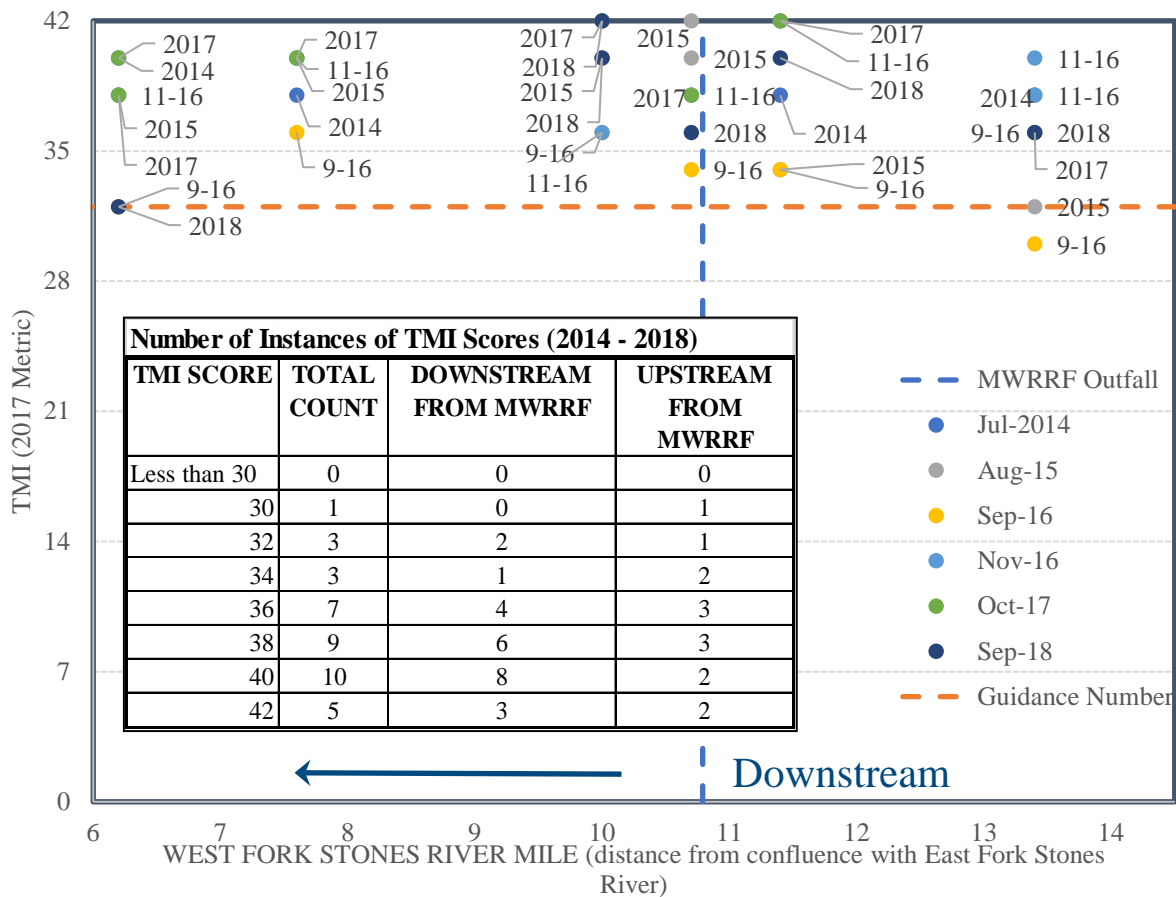
AquAeTer Memo to SSR dated July 10, 2019 Description of Model Costs

DRAFT MEMORANDUM

TO: Mike Bernard, P.E., SSR
CC:
FROM: John Michael Corn, P.E.
DATE: July 10, 2019
JOB NO.: 162441
RE: Description of Model Costs

IS THE WEST FORK STONES RIVER HEALTHY?

AquAeTer has been working with Smith Seckman Reid (SSR) and the City of Murfreesboro in order to assess the water quality of the West Fork Stones River. Since 2014, sample results of the macrobenthic community have shown that the West Fork Stones River is a healthy, thriving stream. A summary of these results is shown in the following figure.



In the previous graph, everything left of the blue dashed line is downstream from the Murfreesboro Water Resource Recovery Facility's (MWWRF) outfall. The orange dashed line is TDEC's guidance threshold. Anything at or above 32 is deemed to be meeting its designated use for biology. Since beginning this work in 2014, no samples downstream from the MWWRF outfall have fallen below the State's threshold, and only one instance overall has been found to dip below this guidance threshold. The River is a healthy stream and is better because of the City's outfall.

In addition to the receiving stream, we have been testing the effluent, the West Fork Stones River upstream from the outfall, and the West Fork Stones River downstream from the outfall to determine the total biochemical oxygen demand. Overall, all of the samples have shown very low Total BOD, always less than 10 mg/L. These were measured over a 90-day period. To put this in perspective, the default limit for a municipal plant is 30 mg/L over 5 days. The City is achieving a level of treatment that is substantially better than the default value and is one of the best in the State.

THE RIVER IS HEALTHY, NOW WHAT?

After the first two years showed positive results, our team proposed to update the wasteload allocation for the West Fork Stones River. The last study had been performed in 1990. The State's model was used to determine the available loading in the River, which has been in use since that time. In order to expand the allowable discharge from the MWWRF, the current allocation, reflective of the substantial changes to the City's operations and changes to the overall use of the West Fork Stones River, needed to be completed.

Meeting with TDEC to Discuss the Plan

Together with representatives from SSR and the MWSD, AquaAeTer presented a plan to TDEC in June 2017. At that meeting, we presented our findings to date and our plan to develop a new wasteload allocation model. The State was receptive to our plan and was very appreciative that the City was both forward thinking and willing to collect data. At the meeting, we proposed using the USEPA model, WASP. TDEC representatives seemed to approve of this approach, since it could be extended into Percy Priest Lake.

Field Study

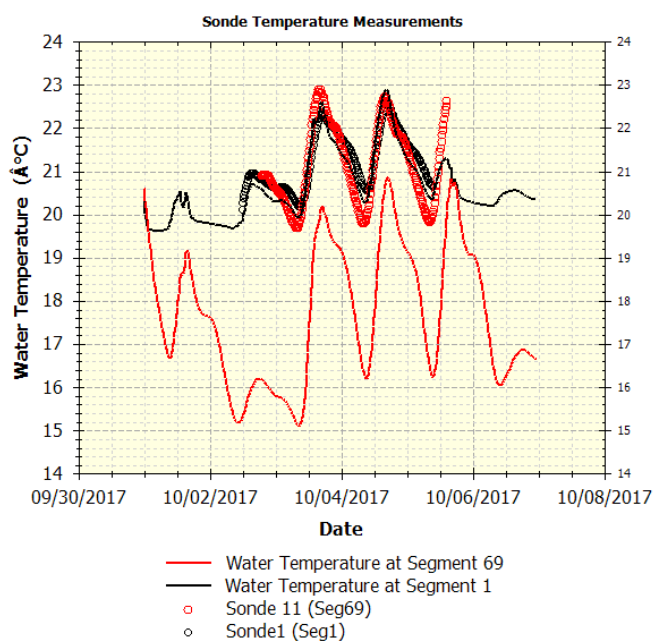
After this meeting, the wasteload allocation study was performed in October 2017. As expected, the River was very healthy. Based on this study, we found that the oxygen concentrations in the West Fork Stones River were greater than the water quality standard. The oxygen demand was approximately one quarter of the demand measured in 1990. The lower demand rate and the lower concentrations of oxygen demanding substances in the West Fork

Stones River mean that there is additional allocation available. The study also found very low concentrations of nutrients including ammonia and phosphorus.

Water Quality Model Development

Following the field study, AquAeTer began developing the new water quality model. The model selected was WASP, the USEPA developed water quality model. This model is promoted as capable of modeling 1, 2, or 3-dimensional grids in either steady-state or hydrodynamic conditions. The influence of the MWRRF effluent during low flow conditions in the River requires a hydrodynamic model. The River itself can be modeled as a 1-D model. This means that the only meaningful change occurs with distance downstream. Once developed, the model could be extended to include Percy Priest Lake. The Lake would require the additional modeling capabilities to model variations in both lateral and vertical dimensions. Since the model is promoted by the USEPA, it has been used and approved in multiple states, including Tennessee. These are the main reasons that WASP was initially selected.

The model was built for the West Fork Stones River within WASP. The hydrodynamics were calibrated, with very good results that matched the field study. The next step in the model calibration was the temperature. Unfortunately, this is where we encountered a roadblock. Temperature is extremely important, since all of the rates used in the model are temperature dependent. The potential amount of oxygen present in the water is also dependent upon temperature. Without the correct temperature, none of the other water quality calculations would be reasonable. Over the domain, the model was losing 3-5 degrees of temperature that was not seen during the field study. It appeared to be a problem in the heat calculations in the model.



In this graph, the circles represent the measured temperature in the West Fork Stones River at the upstream and downstream points. As you can see, there was minimal (less than 1°C) temperature difference between these two points. The modeled black line at the upstream location matches fairly well with the measured data. However, the red line, which is the model prediction at the downstream location is significantly underpredicting the temperature.

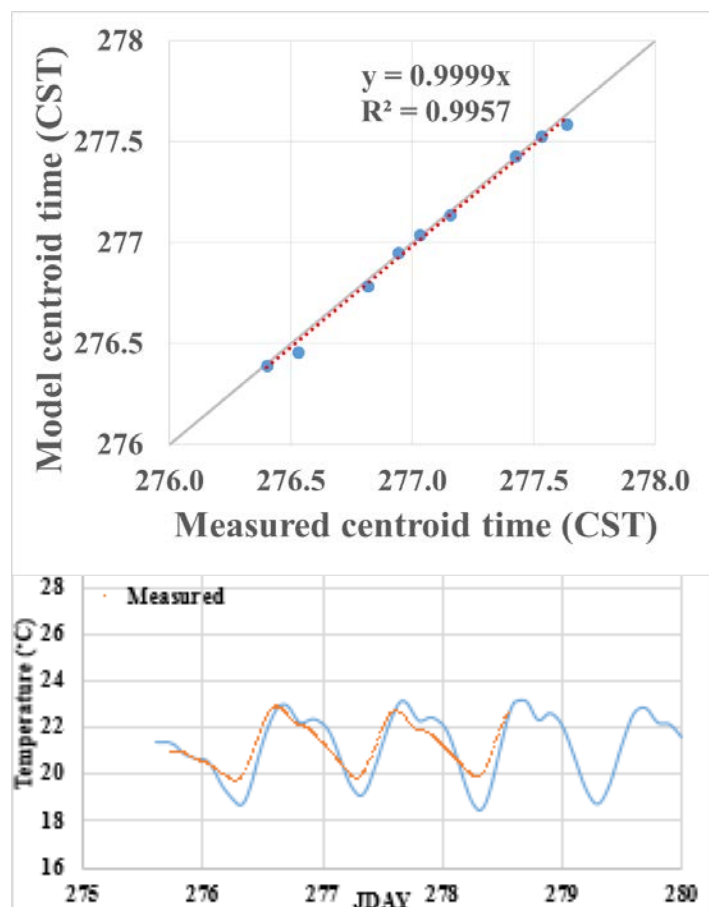
AquAeTer also found that the model was not providing the same answers with multiple runs. This is also unacceptable. At

its core, a water quality model is a series of mathematical equations. If the inputs to the model don't change, then the model should give similar answers every time the model is run.

AquAeTer contacted the model developer at the USEPA. We initially got responses from him. He was able to partially fix the repeatability problem. However, he was not able to fix the heat issue. We attempted to adjust the model inputs to overcome the temperature issue, with some minor success. However, this would make the model useless as a predictive tool. We would also not be able to provide a meaningful technical defense for the modification.

Alternative Water Quality Model

After exhausting considerable effort on every reasonable approach to make WASP work, AquAeTer recommended switching to a different model. The model that was selected was called CE-Qual-W2. This model was developed the United States Army Corps of Engineers to model reservoirs and lakes. The model code is currently being maintained by Portland State University. The model code is open source, which allows us to confirm the model is doing what it says it is supposed to do. The model can be extended to include Percy Priest in the future, if TDEC chooses to do that. In fact, TDEC recently contracted with the U.S. Geologic Society (USGS) to create the model for Percy Priest.



The West Fork Stones River was built in the CE-Qual-W2 as a 1-D model. We have achieved a very good prediction for the flow in the stream. The graph to the left shows the predicted (dotted line) time of travel compared to the measured time of travel (blue dots).

The temperature is also co-operating and is not arbitrarily losing heat. The graph below and to the left is the model predicted temperature (blue line) versus the measured temperature (red dots) at a downstream point in the model. As you can see, it is predicting very well.

WHAT IS REMAINING?

We are finishing up the water quality model calibration and expect to have it completed by the end of this month, with a draft report out in the following month.

REQUEST FOR ADDITIONAL FUNDS

As we have discussed, we attempted to complete the water quality modeling with the WASP model. Our original cost estimate for this portion of the work was \$62,133. A significant portion of that was spent in building the model. The model was essentially complete, but it was predicting poorly. To change models at that point did not make sense at the time. We attempted on multiple occasions to work with the model developer (Tim Wool) to address the problems we were having. Initially, we were getting some response, but Mr. Wool stopped responding to us. By that point, we had exceeded our budget for the model.

It was at that point that we recommended to SSR and MWRD that a different model be utilized. We have spent the past few months developing the CE-QUAL-W2 model, which has shown immediately that it is working better than the WASP model. As an added benefit, the model stewards are responsive to inquiries and the model code is available to confirm the equations the model is using. We also met with SSR, MWRD and TDEC on June 20, 2019 to show the preliminary results from CE-QUAL-W2, and confirm that they would accept the alternative model. TDEC agreed at that time that the new model was acceptable and also indicated that USGS was under contract to use the same model for Percy Priest.

We respectfully request a change order of \$75,000 to cover the cost of the replacement model, time spent in trying to address the original model problems, and preparation of the final report and preliminary wasteload allocation model runs for use by Murfreesboro prior to final model runs for TDEC.

If you should have questions or comments concerning our assessment, please call us at (615) 373-8532 or by FAX at (615) 373-8512 or by e-mail at jmccorn@aquater.com.



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MEMORANDUM

DATE: July 17, 2019
TO: Water Resources Board
FROM: Darren Gore
SUBJECT: Sanitary Sewer and Wastewater Treatment Allocation to Support Future Land Use Assessment

Summary

The last 20-yrs of growth in Murfreesboro has dramatically increased the demands on the wastewater collection system. Regulation of the future allocation of wastewater collection may be necessary for the welfare of the City and its inhabitants.

Background Information

Federal and state regulations outside the City's purview may restrain the City's ability to obtain additional capacity to support future land use in the City's urban growth boundary. Allocating wastewater treatment and/or sanitary sewer collection capacity may:

- Promote and protect public health and safety
- Enhance the economy by establishing reasonable, orderly, equitable and effective means to allocate wastewater collection capacity
- Assist in uniform and balanced future development to serve the needs of the community and the City's tax digest.

Staff has prepared an analysis to review the Salem Hwy corridor and sanitary sewer service area that was master planned in 1999 and compare it to the current build-out in 2019 to see how much sewer has been allocated, and consequently determine how much sewer capacity is remaining for the areas yet to be developed in this corridor.

Additionally, staff will review the annexed areas by zoning the City has experienced between 2009 and 2019 to determine future land uses that may be applied to sanitary sewer and wastewater allocation.

Fiscal Impacts

Undetermined currently.

Attachments:

1. Sewer Allocation Future Land Use Presentation



MWRD SANITARY SEWER ALLOCATION STUDY

An Analysis to Determine Available Sewer Capacity
for Future Land Use

CITY COUNCIL WORKSHOP

July 10, 2019

WHAT PROMPTED THIS STUDY?

- A large influx of recent requests for sewer service to proposed high density developments.
- A concern by staff that certain parts of our sewer collection system were not capable of handling these flows (i.e., undersized pipes) based on previous land use assumptions and densities.
- A meeting with TDEC two weeks ago that does not guarantee that the City's Water Resource Recovery Facility (WRRF) can be expanded in the future.

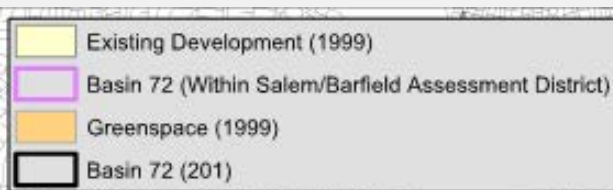
PURPOSE

- Staff believes regulation of the future allocation of wastewater collection is necessary for the welfare of the City and its inhabitants to:
 - *Promote and protect public health and safety*
 - *Enhance the economy by establishing reasonable, orderly, equitable and effective means to allocate wastewater collection and treatment capacity*
 - *To assist in uniform and balanced future development to serve the needs of the community and City's tax digest.*

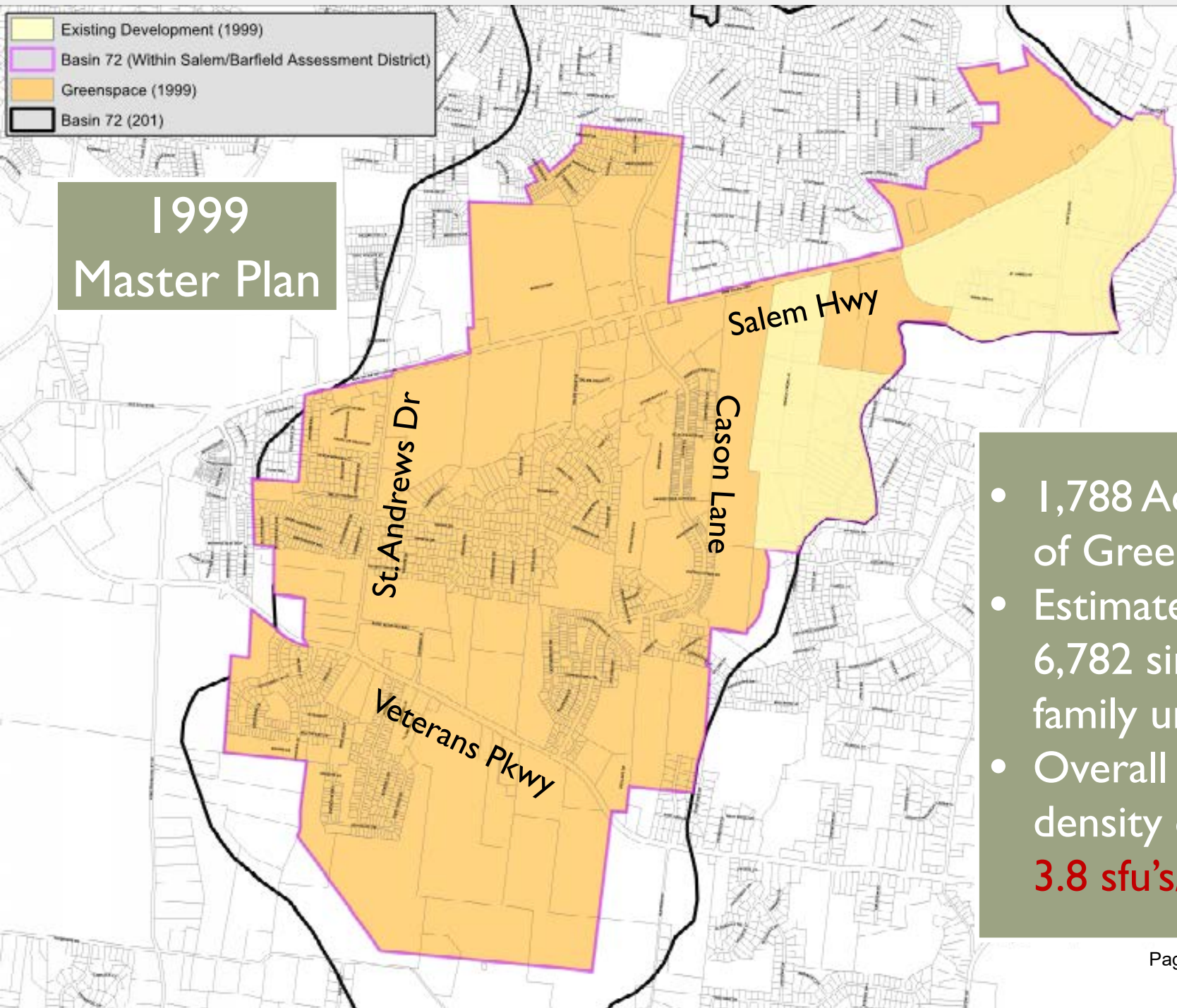
STEP I – Determining “As-Is” Conditions

**ANALYZING A SAMPLE AREA
REPRESENTATIVE OF CITY
GROWTH FROM 1999-2019**

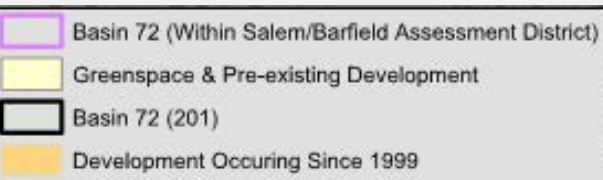
Salem Hwy (SR 99) Corridor
Sanitary Sewer Service Area 72



1999 Master Plan



- 1,788 Acres of Greenfield
- Estimated 6,782 single family units
- Overall density of **3.8 sfu's/acre**



2019
“As-Is”
Allocated

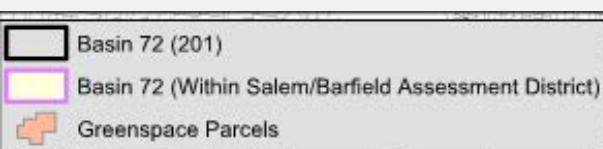
St. Andrews Dr

Cason Lane

Salem Hwy

Veterans Pkwy

- 866 Acres of Development
- 3,688 single family units
- Overall density of **4.3 sfu's/acre** 12% higher



2019
“As-Is”
Remaining

St. Andrews Dr

Cason Lane

Salem Hwy

Veterans Pkwy

- 922 Acres of Development
- 3,094 single family units
- Overall density of **3.4 sfu's/acre**
21% reduction to balance

STEP 2 – Determining Future Land Use Percentages

ASSESS NEW ANNEXATION BY ZONING 2009-2019

City-wide Analysis

ANNEXED AREAS BY ZONING FROM 2009-2019

Parks, 147.7,
3.5%

Industrial, 103.4,
2.4%

Commercial,
1503.2, 35.4%

Residential,
2336.6,
55.1%

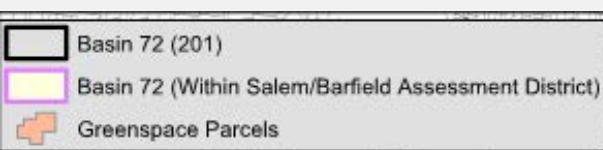
Multifamily,
152.8, 3.6%

- 4,243.6 Acres Annexed 2009-2019
- 12% Increase in City Limits

STEP 3 – Determining Future Allocation

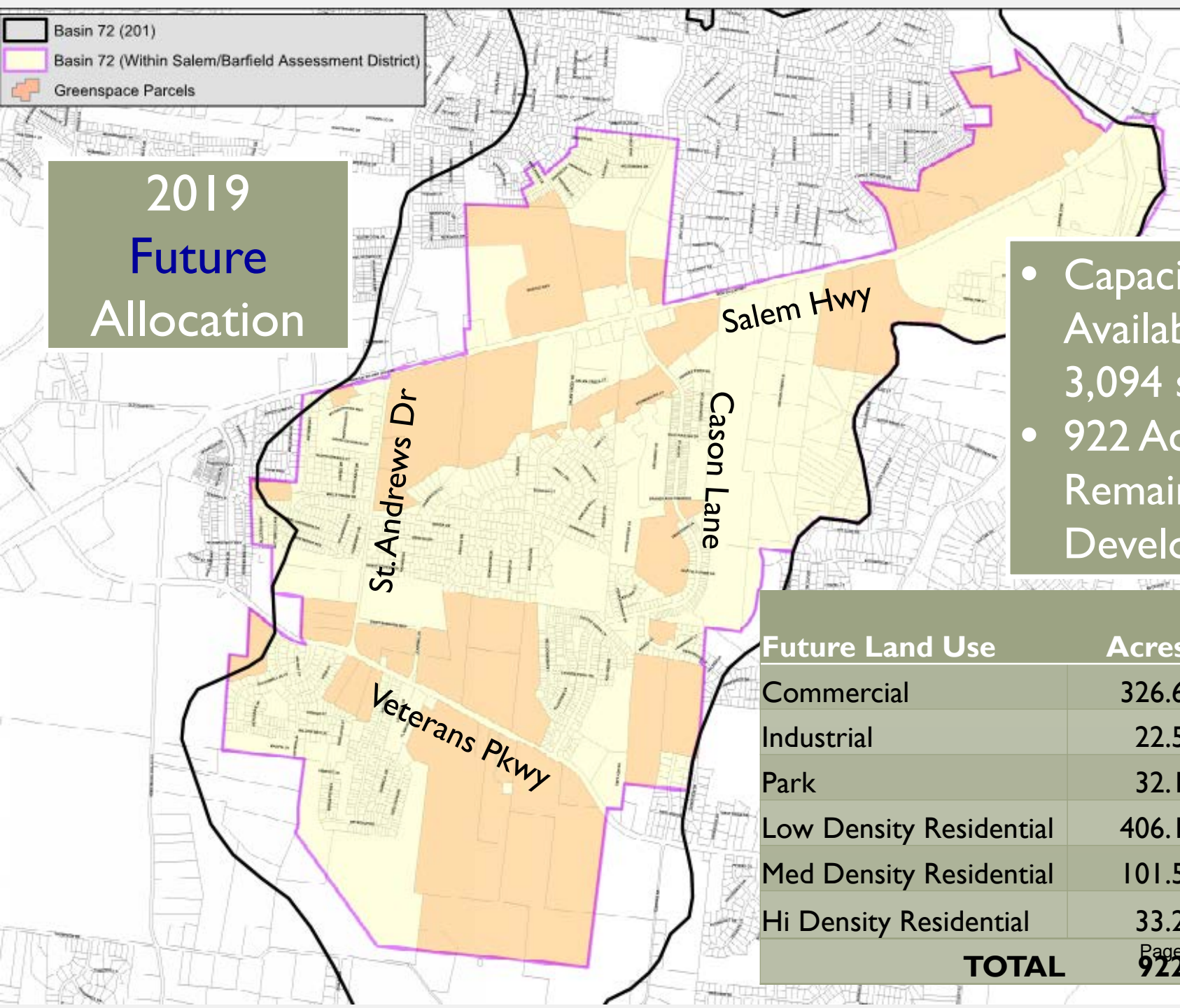
**ALLOCATE REMAINING SEWER
CAPACITY TO REMAINING
ACREAGE BY LAND USE %**

Salem Hwy (SR 99) Corridor
Sanitary Sewer Service Area 72



2019
Future
Allocation

- Capacity Available for 3,094 sfu's
- 922 Acres Remaining to Develop



Future Land Use		Land Use	
	Acres		%
Commercial	326.6		35.4%
Industrial	22.5		2.4%
Park	32.1		3.5%
Low Density Residential	406.1		44.0%
Med Density Residential	101.5		11.0%
Hi Density Residential	33.2		3.6%
TOTAL	922		100.0%

Capacity Available
Single Family Units
on Available Acres

3094
922

WHAT DENSITIES
CAN THE SEWER
SUPPORT?

Future Land Use	%	Acres	Sfu Eq / Ac	Sfu Eq
Commercial	35.4%	326.6	2.0	653.2
Industrial	2.4%	22.5	4.0	90
Park	3.5%	32.1	0.5	16.05
Low Density Residential	44.0%	406.1	3.0	1218.3
Med Density Residential	11.0%	101.5	5.0	507.5
Hi Density Residential	3.6%	33.2	9.0	298.8
		922		2783.9
		100%		90%
				310.1
				10%

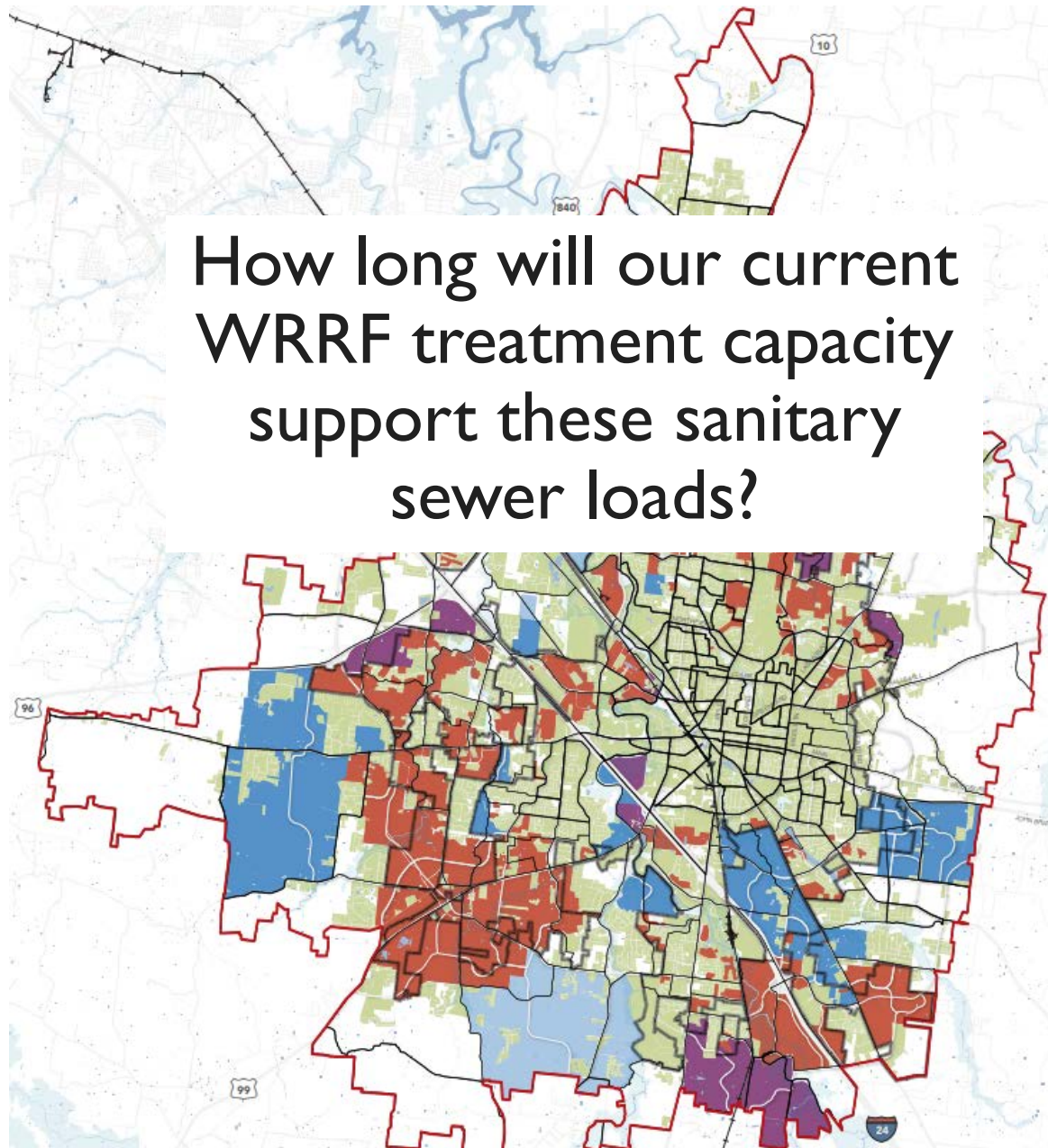
SANITARY SEWER ALLOCATION RECOMMENDATION

Future Land Use	Sfu Eq per Acre	gpd per Acre
Commercial	2.0	520
Industrial	4.0	1040
Park	0.5	130
Low Density Residential	3.0	780
Med Density Residential	5.0	1300
Hi Density Residential	9.0	2340

STEP 4: APPLY SEWER ALLOCATION TO GROWTH SEQUENCING AREAS



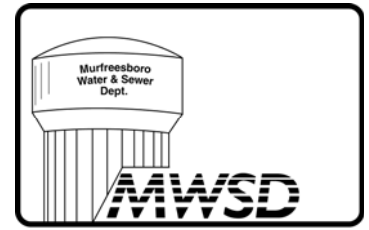
How long will our current
WRRF treatment capacity
support these sanitary
sewer loads?



THE ULTIMATE BOTTLENECK

- Assimilative capacity of the West Fork Stones River
- TDEC's purview on allowing additional expansions of the City's WRRF
- Waste load allocation may need to decrease and densities decrease as we study this further
- Adhere to policy that limits sewer service to areas that are annexable
- Next Step: Visit Gwinnett County, GA July 30th

QUESTIONS
or
COMMENTS?



WATER RESOURCES

DASHBOARD PERFORMANCE

June 2019

MWRD FY2019-2023 CIP

NO.	PROJECT	2018-2019 2018	2019-2020 2019 Issue	2020-2021 2020 Issue	2021-2022 2021 Issue	2022-2023 2022 Issue	TOTAL
	Construction- Northeast Regional PS & Force Main						\$0
	Construction- Biosolids Processing Equipment						\$0
	TOTAL Capital Improvements funded from Debt Service	\$0	\$0	\$0	\$0	\$0	\$0

NO.	PROJECT	2018-2019 2019 FY	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	TOTAL
	Sewer rehab- Account 335	\$1,400,000	\$1,250,000	\$1,250,000	\$1,250,000	\$1,250,000	\$6,400,000
	Meters, Water/Sewer Taps, Hydrants - 280, 290, 300, 310	\$435,000	\$435,000	\$435,000	\$435,000	\$435,000	\$2,175,000
	Water lines- Account 320	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$1,750,000
	Sewer Lines - Account 330	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$1,750,000
	Biosolids Processing Equip & Storage Sinking Fund	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2,500,000
	Walter Hill Dam Repair/Remediation Sinking Fund	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$625,000
	Lift Station Replacement Sinking Fund	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,250,000
	NE Regional PS & FM Sinking Fund	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2,500,000
	GAC Replacement	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$550,000
	Vehicle and Equipment Replacement	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$7,500,000
	TOTAL Capital Improvements funded from Rates	\$5,520,000	\$5,370,000	\$5,370,000	\$5,370,000	\$5,370,000	\$27,000,000

NO.	PROJECT	2018-2019 2019 FY	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	TOTAL
	W&S CAPITAL IMPROVEMENT PROJECTS						
	Misc FY19 Working Reserve Commitments	\$1,800,000					\$1,800,000
	Biosolids Processing Equipment & Storage Addition	\$1,000,000	\$1,000,000	\$8,500,000	\$5,500,000		\$16,000,000
	Overall Creek Pump Station Upgrade	\$350,000	\$1,500,000	\$3,500,000	\$3,500,000		\$8,850,000
	NE Regional Engineering Design	\$500,000	\$1,500,000	\$250,000	\$250,000	\$250,000	\$2,750,000
	NE Regional P.S. & Force Main		\$500,000	\$2,500,000	\$10,000,000	\$7,500,000	\$20,500,000
	Cherry Lane / Sazerac Sanitary Sewer		\$1,000,000	\$1,500,000			\$2,500,000
	SR840 Interchange Area Sanitary Sewer	\$200,000	\$1,100,000	\$1,100,000			\$2,400,000
	Hwy96 Park Property Area Sewer		\$300,000	\$2,000,000	\$2,000,000		\$4,300,000
	MWRRF Wet Weather Treatment Train Impr		\$50,000		\$2,500,000	\$2,500,000	\$5,050,000
	Lift Station Rehab/Replacement (#9) Ransom Dr.	\$935,000					\$935,000
	Mill Street Painting, Halls Hill and Tiger Hill Tank Repairs		\$2,550,000				\$2,550,000
	WTP Membrane Replacement			\$650,000			\$650,000
	Direct Potable Reuse Demonstration			\$150,000	\$350,000		\$500,000
	Stones River Water Qual Sampling / NPDES Permitting	\$500,000	\$150,000	\$150,000	\$150,000	\$150,000	\$1,100,000
	Subtotal CAPITAL PROJECTS	\$5,285,000	\$9,650,000	\$20,300,000	\$24,250,000	\$10,400,000	\$69,885,000
	TRANSPORTATION (Water/Sewer Imp.)						
	Bradyville Pike			\$1,500,000	\$1,500,000	\$500,000	\$3,500,000
	Jones Blvd Widening		\$500,000	\$500,000			\$1,000,000
	Cherry Lane Repurified Main Extension (14,600 LF)		\$825,000	\$1,000,000			\$1,825,000
	Cherry Lane Sanitary Sewer Construction	\$75,000	\$500,000	\$1,500,000			\$2,075,000
	SR 99 Widening- Old Fort to Cason Lane		\$500,000	\$500,000	\$500,000		\$1,500,000
	St. Clair St.		\$500,000				\$500,000
	John Rice Blvd & Rucker Lane		\$200,000				\$200,000
	Maney Avenue Reconstruction - Phase 2		\$250,000	\$250,000			\$500,000
	Wilkinson Pike Reconstruction (MCP to TL)		\$650,000	\$650,000			\$1,300,000
	Subtotal TRANSPORTATION PROJECTS	\$75,000	\$3,925,000	\$5,900,000	\$2,000,000	\$500,000	\$12,400,000
	REHABILITATION						
	Sewer Rehabilitation - Maintenance Contract	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$5,000,000
	INFORMATION TECHNOLOGY PROJECTS						
	IT/Computer Systems Hardware Upgrades	\$50,000	\$100,000	\$100,000	\$100,000	\$100,000	\$450,000
	Electronic Content Management (Scanning/Imaging)		\$150,000	\$150,000	\$150,000		\$450,000
	IT Design Services & Consulting	\$100,000	\$100,000	\$100,000	\$50,000		\$350,000
	Comp Maintenance Management System (CMMS)		\$400,000	\$600,000			\$1,000,000
	Subtotal INFORMATION TECHNOLOGY PROJECTS	\$150,000	\$750,000	\$950,000	\$300,000	\$100,000	\$2,250,000
	TOTAL Projects from Working Capital Reserves	\$6,510,000	\$15,325,000	\$28,150,000	\$27,550,000	\$12,000,000	\$89,535,000

PROJECTED RESERVE FUND BALANCE REVENUE (TAPS)	\$7,200,000	\$7,000,000	\$7,000,000	\$7,000,000	\$7,000,000
SINKING FUND DEPOSITS TO RESERVES FROM RATES	\$2,775,000	\$2,625,000	\$2,625,000	\$2,625,000	\$2,625,000
SECURED MIN. BALANCE FOR WORKING CAPITAL RESERVES	\$22,351,742	\$22,798,777	\$23,254,752	\$23,719,847	\$24,194,244
PROJECTED WORKING CAPITAL RESERVE BALANCE	\$75,548,239	\$69,848,239	\$51,323,239	\$33,398,239	\$31,023,239
FUNDS ABOVE SECURED MINIMUM BALANCE	\$53,196,497	\$47,049,462	\$28,068,487	\$9,678,392	\$6,828,995

Preliminary *Draft* 5-YR CAPITAL IMPROVEMENTS PLAN (CIP)
STORMWATER UTILITY FUND, FY19-23

NO.	PROJECT	Originator	2018-2019 2019 FY	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	TOTAL
			<i>Projected</i>	<i>Budget</i>	<i>Pro Forma</i>	<i>Pro Forma</i>	<i>Pro Forma</i>	
	Neighborhood Projects (NP)							
NP-1	Memorial Blvd / Haynes Dr. Drainage Improvements	City Eng	\$0	\$125,000	\$50,000			\$175,000
NP-2	Mitchell-Nielson Drainage Project	City Eng	\$50,000	\$50,000				\$100,000
NP-3	Huntwood/Leaf Ave Neighborhood Drainage Imp.	City Eng	\$0	\$100,000	\$100,000			\$200,000
NP-4	Southern Meadows / Kimbro Woods Drainage Imp.	City Eng	\$25,000	\$500,000	\$500,000			\$1,025,000
NP-5	Liberty Dr. / Thatcher Trace Spring Box	City Eng	\$0	\$50,000	\$75,000			\$125,000
NP-6	Pennington Drive Drainage Repair/Upgrade (Added)	City Eng						\$0
NP-7	Gateway Pond Repair	Eng/MRSD						\$0
NP-8	Hardwood Drive Drainage Upgrade (Added)	City Eng	\$0	\$250,000				\$250,000
NP-9	Pacific Place/Riverrock Blvd Drainage Imp.	City Eng	\$0	\$0	\$0			\$0
	Subtotal		\$75,000	\$1,075,000	\$725,000			\$1,875,000
	Water Quality Improvement (Compliance) Projects (WQ)							
WQ-1	Town Creek Bioretention BMP's @ Cannonsburgh	MWRD						\$0
WQ-2	Molloy Lane Water Quality Pond	MWRD		\$25,000	\$125,000	\$75,000		\$225,000
WQ-3	Rosebank Springs Constructed Wetlands	City Eng	\$35,000	\$35,000	\$165,000	\$115,000		\$350,000
WQ-4	Lee's Branch Stream Restoration	City Eng		\$25,000				\$25,000
WQ-5	West Fork Stones River at Cason Trail; bank repair	MWRD	\$40,000	\$140,000				\$180,000
WQ-6	Bear Branch Water Quality Mitigation	City Eng						\$0
WQ-7	Sinking Creek Headwater protection BMP	MWRD/Eng		\$30,000	\$50,000	\$150,000	\$150,000	\$380,000
WQ-8	Todd's Lake Regional Wetlands Improvements	City Eng						\$0
WQ-9	Hooper's Bottom Regional Water Quality Project	City Eng	\$25,000	\$25,000	\$150,000		\$175,000	\$375,000
WQ-10	Lytle Creek/Ridgley Road Bacteriological Reduction (Added)	MWRD	\$10,000	\$15,000	\$75,000	\$25,000		\$125,000
WQ-11	Memorial Blvd/VA Pond Trash Rack (Added)	MWRD						\$0
WQ-12	Spence Creek Restoration	MWRD/Eng	\$25,000	\$25,000	\$25,000	\$25,000		\$75,000
WQ-13	E. Lokey Ave Trash Rack at Sinking Creek	MWRD		\$30,000	\$75,000			\$105,000
WQ-14	Sinking Creek/ Northfield Blvd Commercial Retrofit Study/Project	MWRD	\$10,000	\$25,000	\$50,000	\$100,000		\$185,000
WQ-15	Overall Street retrofit/ bioretention - streetscape	MWRD		\$35,000	\$100,000			\$135,000
WQ-16	Downtown planter box retrofits study/project	MWRD	\$10,000	\$50,000	\$50,000			\$110,000
	Subtotal		\$155,000	\$460,000	\$865,000	\$490,000	\$325,000	\$2,295,000
	Public Drainage/Streets Participation Projects (PD)							
PD-1	Maney Avenue Phase 2	City Eng	\$50,000					\$50,000
PD-2	Town Creek Conveyance (Murfree Springs to Cannonsburgh)	City Eng	\$50,000	\$500,000	\$250,000	\$100,000		\$900,000
PD-3	Maple St. Alley Permeable Paver Project	City Eng						\$0
	Subtotal		\$100,000	\$500,000	\$250,000	\$100,000		\$950,000
	Totals		\$ 330,000	\$2,035,000	\$ 1,840,000	\$ 590,000	\$ 325,000	\$ 5,120,000

EFFECTIVE UTILITY MANAGEMENT
Financial Viability
MWRD WORKING CAPITAL ACCOUNT SUMMARY

ESTIMATED Working Capital at 6/30/19

Board Designated (System Dev, Assessments, etc) as of 6/30/18	\$	31,858,736
Undesignated Excess Funds as of 6/30/18		41,978,125
Estimated Reserve Revenue thru 6/30/19		9,339,343
Estimated Reserve Expenditures thru 6/30/19		(6,999,446)
		76,176,758

COMMITTED Reserves at 6/30/19

24" Repurified PVC Pipe (O&M, Coleman Farm)	143,640	
Purchase of Two (2) Aerators at WRRF	255,348	
SSR Task Order - Mill, Tiger, Halls Hill Tank Painting	169,595	
Main Stay Suites Sewer Upsizing Participation	45,300	
SSR Task Order 201 Facilities Plan	249,860	
SSR Task Order WRRF Capacity Study	21,177	
SSR Task Order Overall Creek PS Capacity Study	35,908	
Sewer Participation - Brinkley Ave, Farrer Property	42,870	
Penn Valley Pump Replacement	31,944	
Biosolids Thermal Dryer Install (JBS & MR)	152,965	
Overall Creek P.S. Upgrades (VFD's)	351,042	
2019 Sewer Rehab Design - S&ME	333,579	
WRRF Aerator 2A Gearbox Replacement	130,930	
Walter Hill Dam Remediation	376,593	
Biosolids Small-scale Thermal Dryer	216,250	
H-S Blackman Park Sewer Design	180,000	
Water Line Replacement @ Airport Terminal	56,000	
SRWTP Raw Water Pumps Replacement	44,700	
SEC Jones Blvd Utility Design Proposal	14,225	
Northeast Regional PS & Conv - SSR	2,025,423	
Waste Load Allocation Study	138,197	
Bradyville Pike Utility Design - Neil-Schaffer	22,710	
Wilkinson Pike Utilities Design	10,190	5,048,446

APPROVAL Requests at 7/23/19

Sanitary Sewer 2019/20 Rehabilitation Contract	3,842,301	
Hobas Pipe Materials Testing	11,720	
Waste Load Allocation Model Additions	75,000	
CIS Software Upgrade V4	343,000	
Walter Hill Dam Change Order	75,503	4,347,524

BALANCE of Working Capital at 7/23/19 after COMMITMENTS **\$ 66,780,788**

DESIGNATED Projects Pending

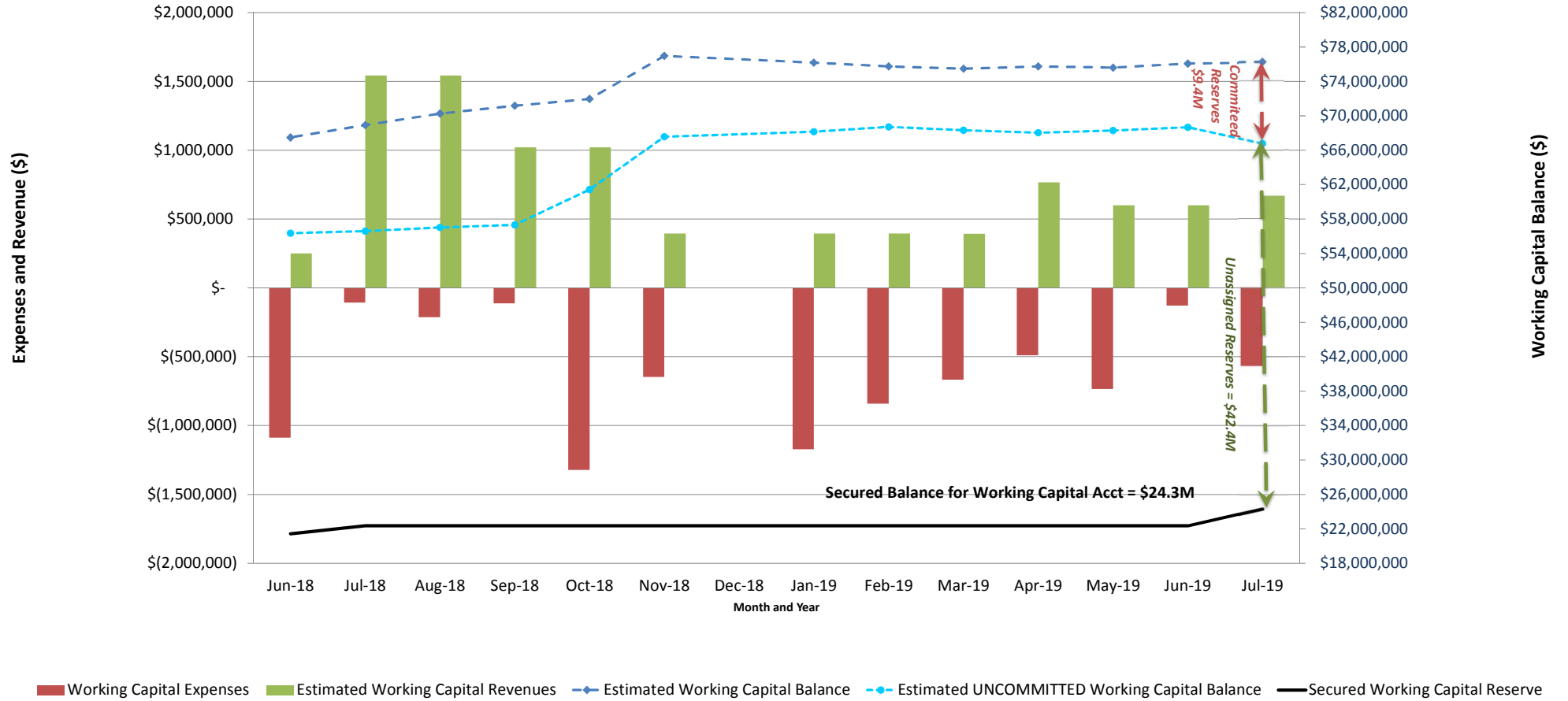
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ESTIMATED UNCOMMITTED Working Capital Reserves as of July 23, 2019 **\$ 66,780,788**

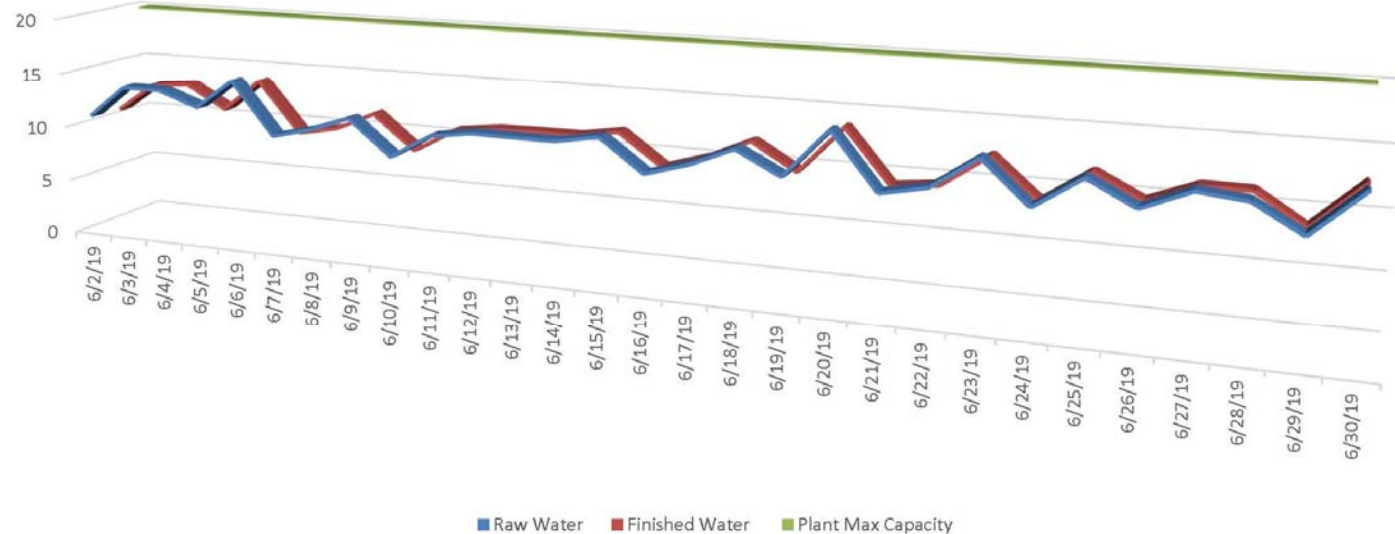
SECURED FY19-20 Operating and Maintenance Expenses **\$ 24,331,276**

UNASSIGNED Working Capital Funds (Est. Uncommitted - Secured) **\$ 42,449,512**

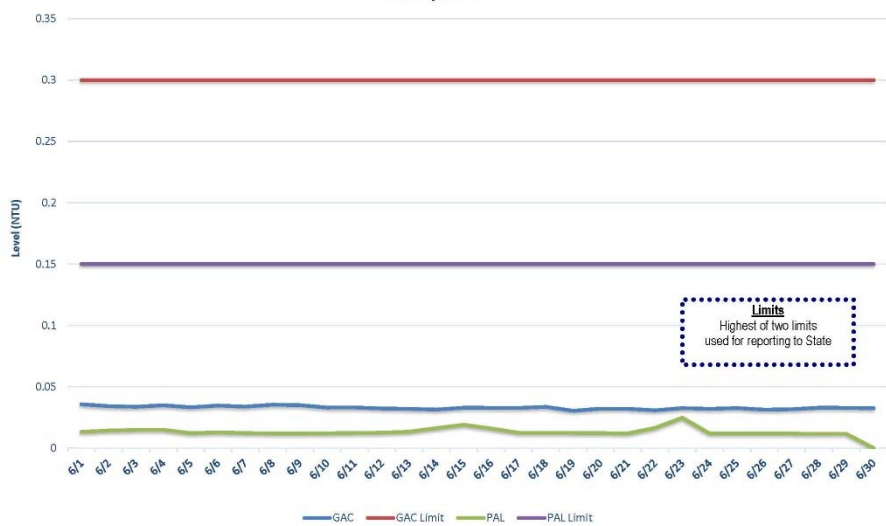
MWRD Working Capital Reserves Dashboard



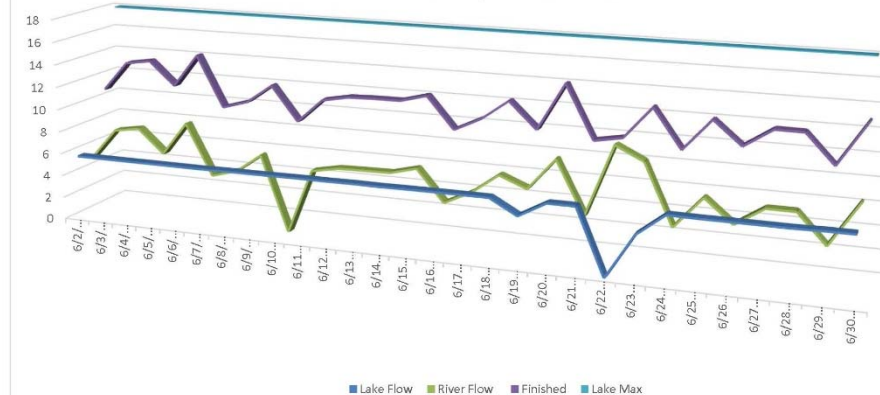
Dashboard Performance for June 2019 Stones River Water Treatment Plant



Turbidity Levels



Lake/River Flow



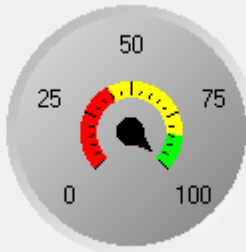
Total Finished Water Volume: 347.84 MG
Total Billed Water Volume: 270.96 MG
Water Loss: 22%

MURFREESBORO WATER RESOURCE RECOVERY FACILITY

DASHBOARD REPORT

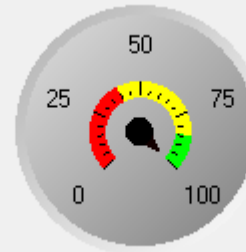
June, 2019

BOD PERCENT REMOVAL



98.5

AMMONIA PERCENT REMOVAL



99.6

426.209
**MILLION GALLONS
TREATED**

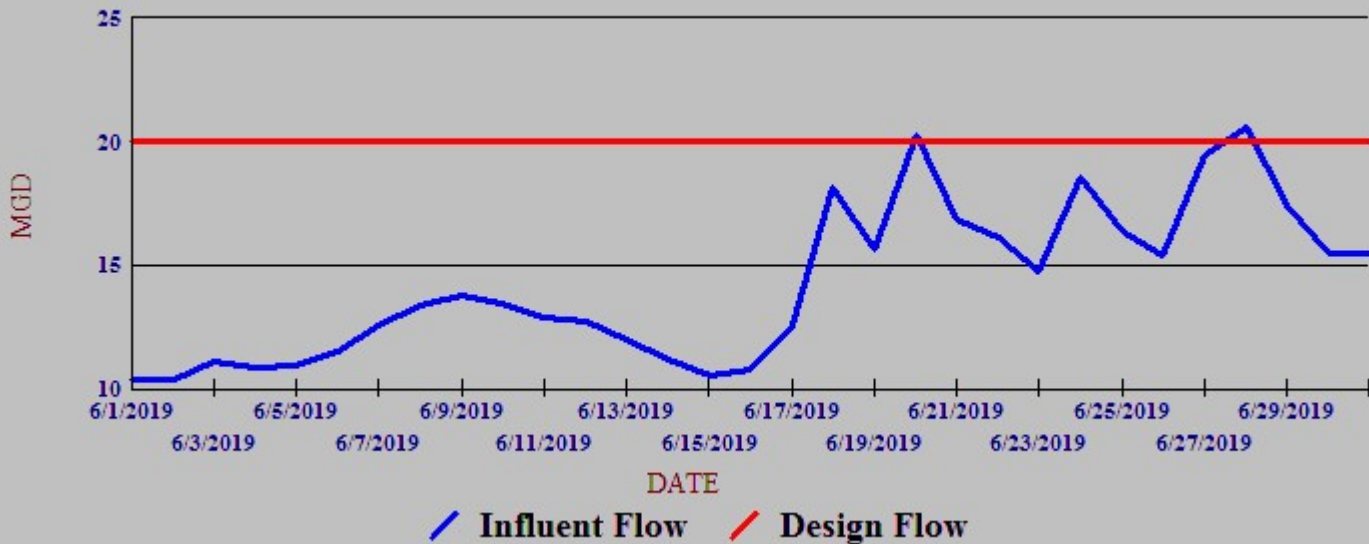
1,400.78
**TONS
BIOSOLIDS
REMOVED**

EFFLUENTS

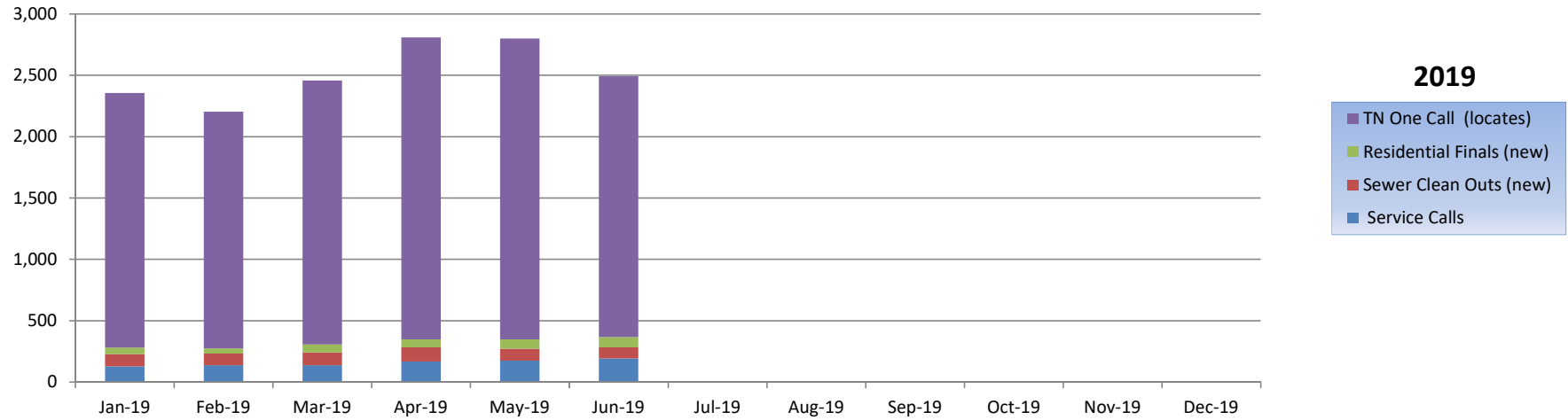


MGD
■ DISCHARGE ■ REUSE

AVERAGE INFLUENT FLOW

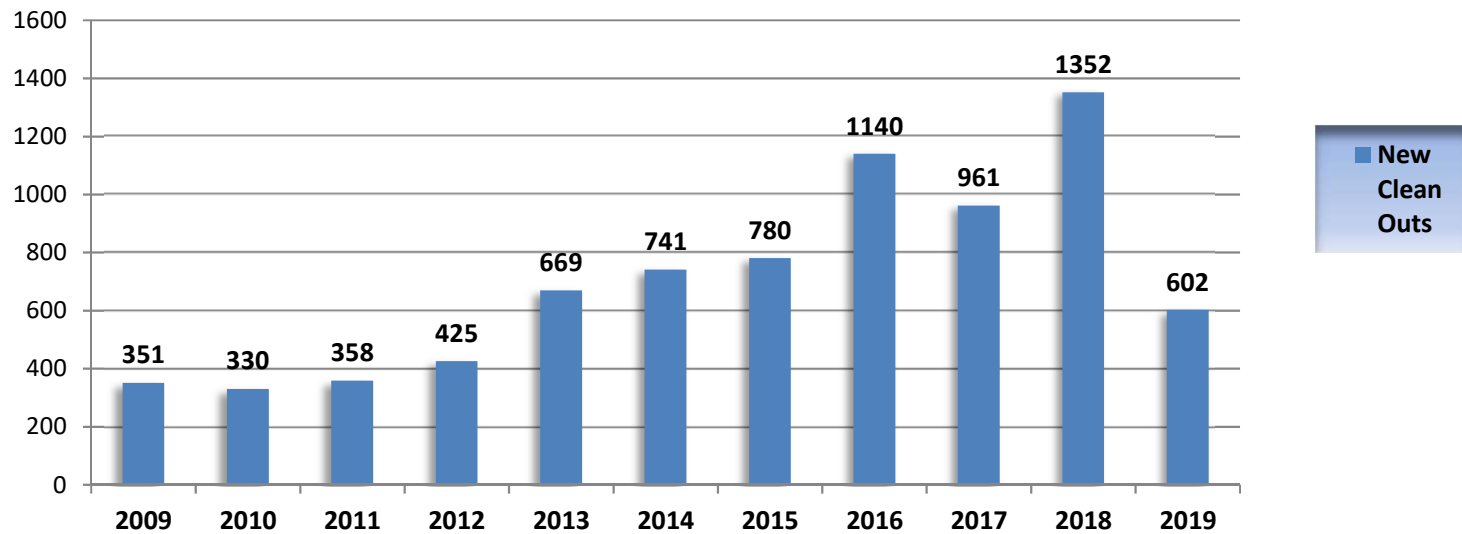


OPERATIONS & MAINTENANCE MONTHLY TOTALS



	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Total
Service Calls	129	138	139	168	176	193							943
Sewer Clean Outs (new)	100	95	104	115	97	91							602
Residential Finals (new)	52	41	65	65	76	84							383
TN One Call (locates)	2,076	1,931	2,150	2,463	2,452	2,125							13,197
TOTAL	2,357	2,205	2,458	2,811	2,801	2,493							15,125

NEW SEWER CLEAN OUTS



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
New Clean Outs	351	330	358	425	669	741	780	1140	961	1352	602

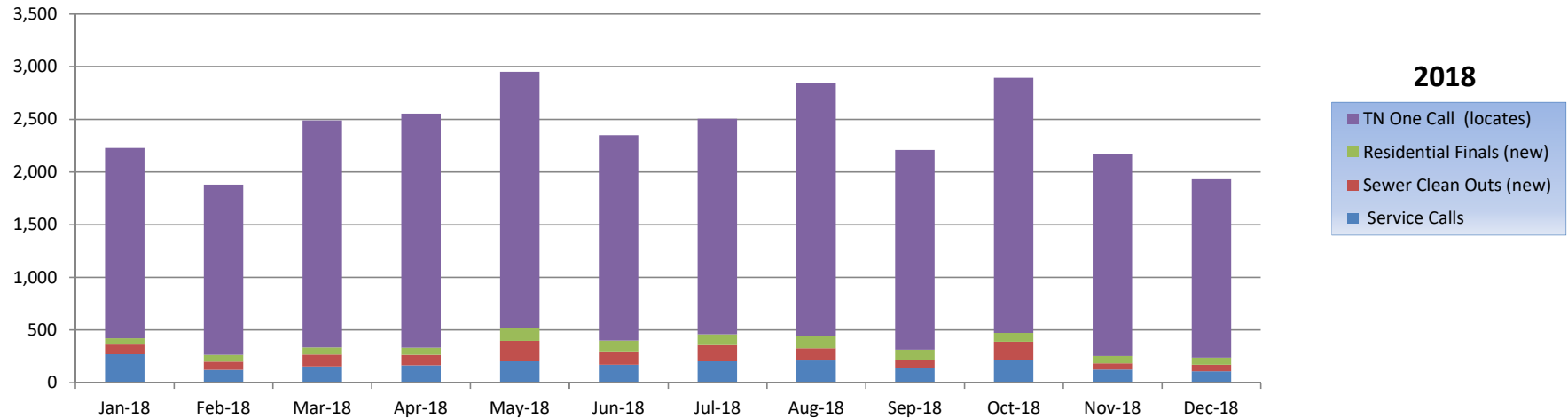
** For the calendar year Jan-Dec*

MWRD OPERATIONS & MAINTENANCE

ASPHALT PURCHASES

<i>Date</i>	<i>Approval</i>	<i>Vendor</i>	<i>Type</i>	<i>Rate</i>	<i>Qty</i>	<i>Total</i>	<i>FY Total</i>
7/26	D. Hughes	Hawkins	BM Mix	\$59.75	17.96	\$1,073.11	\$1,073.11
7/30	D. Hughes	Hawkins	BM Mix	\$59.75	17.96	\$1,073.11	\$2,146.22
7/31	D. Hughes	Hawkins	411-E Mix	\$60.05	15.92	\$956.00	\$3,102.22
8/2	D. Hughes	Hawkins	BM Mix	\$53.64	6.00	\$321.84	\$3,424.06
10/1	D. Hughes	Vulcan	BM Mix	\$54.63	46.42	\$2,535.93	\$5,959.99
10/31	D. Hughes	Hawkins	BM Mix	\$54.60	25.04	\$1,367.18	\$7,327.17
10/31	D. Hughes	Hawkins	CW Mix	\$65.00	40.05	\$2,603.25	\$9,930.42
11/30	D. Hughes	Hawkins	BM Mix	\$51.25	60.10	\$3,080.13	\$13,010.55
12/19	D. Hughes	Vulcan	411-E Mix	\$63.94	16.51	\$1,055.65	\$14,066.19
12/27	D. Hughes	Hawkins	BM Mix	\$58.29	99.54	\$5,802.19	\$19,868.38
4/30	D. Hughes	Hawkins	BM Mix	\$50.96	180.61	\$9,203.89	\$29,072.27
4/30	D. Hughes	Hawkins	BM Mix	\$50.96	181.09	\$9,228.35	\$38,300.61
4/30	D. Hughes	Hawkins	BM Mix	\$50.96	180.61	\$9,203.89	\$47,504.50
4/30	D. Hughes	Hawkins	BM Mix	\$50.96	110.82	\$5,647.39	\$53,151.89
4/30	D. Hughes	Vulcan	411-E Mix	\$67.50	8.32	561.60	\$53,713.49

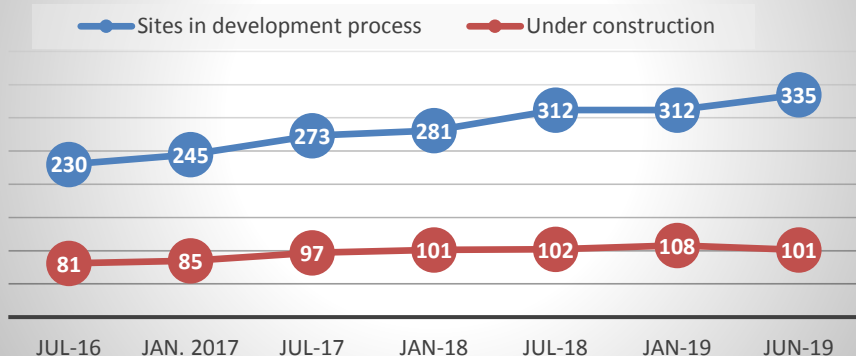
OPERATIONS & MAINTENANCE MONTHLY TOTALS



	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Total
Service Calls	273	124	155	167	205	171	206	213	137	221	127	109	2,108
Sewer Clean Outs (new)	91	78	115	99	195	128	153	117	84	169	59	64	1,352
Residential Finals (new)	60	65	66	69	119	102	103	117	93	84	71	68	1,017
TN One Call (locates)	1,805	1,614	2,155	2,222	2,434	1,949	2,046	2,404	1,896	2,421	1,918	1,692	24,556
TOTAL	2,229	1,881	2,491	2,557	2,953	2,350	2,508	2,851	2,210	2,895	2,175	1,933	29,033

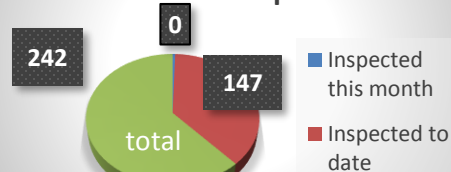
Stormwater Dashboard – June 2019

Construction Phase Inspections of Stormwater Control Measures (SCMs)



Inspection Program

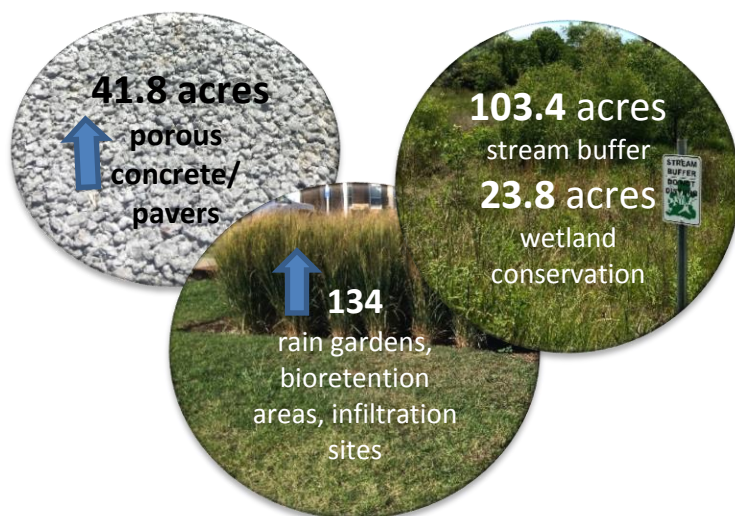
Stormwater Post Construction Inspections



Education and Outreach



LID/ Green Infrastructure



Stormwater Infrastructure

	June	YTD	Total
Junction Boxes	29	293	16,039
Headwalls	19	131	6,743
Ponds	0	24	494
Gravity Mains	4,118 ft	42,865 ft	690.8 miles
Weirs	1	17	287
WQ Units	0	5	110
Underground Storage	0	0	30

Water Quality Scorecard

